

STAFFORDSHIRE COUNTY COUNCIL.

ARSENIC IN BEER.

REPORT

BY

COUNTY MEDICAL OFFICER

AND

COUNTY ANALYST.

January 16th, 1901.

STAFFORDSHIRE COUNTY COUNCIL.

ARSENIC IN BEER.

REPORT

BY

COUNTY MEDICAL OFFICER

AND

COUNTY ANALYST.

January 16th, 1901.

County Medical Officer's Report.

At a meeting of the Sanitary Committee held on Dec. 1st, 1900, I called attention to an extensive epidemic ailment attributable to the presence of arsenic in beer which had occurred chiefly in Manchester and the neighbourhood, and pointed out that there was reason to fear that this County had not escaped.

Circumstances
which led to
the enquiry.

The first circumstance which excited suspicion among medical men was the occurrence, during the preceding few months, of a phenomenal increase of cases of peripheral neuritis, an affection which is usually met with among persons who are addicted to alcoholic excesses, especially spirit drinkers.

To Dr. Reynolds, Assistant Physician to the Manchester Royal Infirmary, and Visiting Physician to the Manchester Workhouse Infirmary, the credit is due of first recognising the true nature and cause of the malady. Having had occasion to treat numerous cases at both Infirmaries, it became apparent to Dr. Reynolds that while most of the signs and symptoms of alcoholic neuritis were present, other symptoms presented themselves in most of the cases which were not characteristic of that disease, but which were characteristic of arsenical poisoning. He and others also observed that the large

majority of the patients then suffering from peripheral neuritis were beer drinkers, and this led him to suspect beer as being the vehicle of the arsenic. His suspicions having thus been roused, Dr. Reynolds analysed certain samples of beer sold in Manchester, with the result that, on Nov. 18th, he found a "considerable amount" of arsenic in the samples. The presence of the poison was subsequently confirmed by himself and others, and thus, through the publication of the facts in the press, on November 23rd, the scare arose which has led to this and other enquiries.

The source of the arsenic was at first a mystery, but in course of time it was conclusively traced, in the first instance by Professor Delépine, of Manchester, to the use of contaminated glucose, and as the investigations proceeded, evidence soon began to accumulate which pointed to the conclusion that one firm only were responsible for the manufacture of the arsenical glucose, a conclusion which has since been amply confirmed; I may say at once that the firm in question were Messrs. Bostock & Co., Liverpool.

In the Report of our County Analyst upon the chemical aspect of the question, which is embodied in this Report, the Committee will find a concise statement regarding the process of manufacture of glucose, which clearly explains the source of the arsenical contamination.

FACTS AS REGARDS STAFFORDSHIRE.

How the enquiry was conducted.

The Committee having approved my suggestion that the matter should be specially enquired into, and having passed a resolution instructing the Inspectors under the Sale of Food and Drugs Act to curtail for a time the routine work and devote their attention to the collection of samples of beer and brewing materials to be tested for arsenic only, no time was lost in getting to work.

As time was of importance, I immediately invited the co-operation of the Medical Officers of Health of the various districts of the County, including County Boroughs, to whom I addressed a circular-letter setting forth the sort of informa-

tion I was desirous of obtaining, and enclosing a printed sheet of questions. The immediate object I had in view was to locate any cases which might have occurred in this County, and to ascertain, if possible, the source of the implicated beer. To have attempted to obtain this information by a direct appeal to every medical practitioner in the County would have involved considerable delay, and such an appeal, I feel satisfied, would only have met with partial success. On the other hand, previous experience having taught me that I might rely upon the willing help of local Medical Officers of Health, I did not hesitate to seek their assistance. They, of course, both from their own experience as medical practitioners and because of the facility with which they could directly ascertain the experience of their fellow practitioners, were in a position to supply the needful information with less delay and with greater fulness than would have been possible had I adopted the alternative method of a direct appeal to every medical practitioner. At the same time, I did not entirely confine my appeal for information to Medical Officers of Health, as it appeared to me that, supposing there was substantial ground for alarm, many cases would probably be met with among the large class of persons who habitually seek hospital treatment. Accordingly, I decided to communicate direct with every medical man engaged in hospital practice throughout the County.

I am pleased to state that very full information soon reached me as the result of both appeals. In the course of a few days every Medical Officer of Health, including those of County Boroughs, had filled in and returned the circulars, as had also most of the medical members of the hospital staffs, and I was thus in possession of information, not only as to the localities where cases had occurred, but also, in many instances, as to the suspected sources of the arsenical beer. At first the Inspectors had no information to guide them in the collection of samples, but as the returns referred to came in, I was able to make suggestions from day to day as to how they might best direct their movements with the view of

securing the fullest possible value, in the shape of pertinent information, in return for the time and labour involved in the collection of samples and in the analytical work.

No. of arsenical
poisoning cases
in the County.

Attached to this report is a map showing, by means of red spots, the extent to which each district has suffered, each spot representing a case. I had hoped to have been able to indicate, by means of distinctively coloured spots, the approximate number of cases attributable to different implicated breweries, but this idea had to be discarded as impracticable, owing to the unexpectedly large number of these.

Including the four County Boroughs of Wolverhampton, Walsall, West Bromwich, and Hanley, there are 61 sanitary districts in the County, of which 42 are urban, and 19 rural. In the whole County, after discarding merely suspicious cases, no less than 667 cases, approximately, have occurred in 25 districts, of which 18 are urban, and seven are rural.

The following are the districts in which cases occurred, together with the approximate number of cases in each :—

Amblecote Urban	...	...	5	Stone Urban	...	...	69
Bilston	„	...	4	Tipton	„	...	13
Brownhills	„	...	31	Walsall County Borough	4		
Cannock	„	...	14	Wednesbury Urban	...	4	
Coseley	„	...	5*	Willenhall	„	...	2
Darlaston	„	...	88	Blore Heath Rural	...	3	
Hanley County Borough	...	5		Cannock	„	...	3
Lichfield Urban	...	...	91	Cheadle	„	...	2
Longton	„	...	6	Eccleshall	„	...	6
Newcastle	„	...	3	Gnosall	„	...	4
Rugeley	„	...	8	Lichfield	„	...	290
Short Heath	„	...	1	Stone	„	...	2
Stafford	„	...	4				

The first thing which strikes one on glancing at the spot map is the fact that the distribution of the cases bears no ratio whatever to the density of the population, and that with one

* One of these cases, it is believed, resulted from beer consumed while on a visit to Blackpool.

exception (Darlaston), the groups of populous towns, including the large County Boroughs, in the north and south of the County, have been, comparatively speaking, free from cases. As regards the South Staffordshire towns, this circumstance was at once satisfactorily accounted for by the analytical results, but in the first instance it was not so easy to explain the absence of cases in the North Staffordshire towns, although the reason became apparent later on when further information was obtained from the implicated brewers, as will be explained presently.

It is impossible to gauge, even approximately, the amount Extent of Injury to health. of injury, from a health point of view, which has resulted from this wholesale poisoning by arsenic in the Midlands, but it is likely that many have suffered in a mild degree who either did not seek medical assistance or the cause of whose illness was not recognised. Again—leaving out of consideration the misery which must have resulted from thousands of people being incapacitated from work for long periods—it is not unlikely that, among those who have suffered most, organic changes may have resulted which will cause a permanent impairment of health sufficient to partially, if not entirely, prevent them from following their usual occupations, and lessen their chance of recovery in the event of serious illness in the future. In all probability, also, fatal cases have occurred which, before the true nature of the illness was discovered, were attributed to alcoholic neuritis.

Another consideration which occurs to me is, how long may not poisoning from arsenical beer have been going on, in a milder and unrecognisable form, owing to the use of less seriously contaminated glucose? Supposing that impure sulphuric acid was not used for the first time some months ago in the preparation of glucose, then it is more than likely that mild cases of poisoning did take place, and that it was only when an exceptionally contaminated acid was employed that the quantity of arsenic in the beer was sufficient to make its presence apparent in so alarming a manner.

So far as I can discover from available records, arsenical poisoning on such a scale as this has not previously occurred in England, but, in 1888, as described by Berthélemy, 405 cases of poisoning occurred at Hyères, owing to a mistake on the part of a wine merchant who poured a solution of arsenic into wine casks. The symptoms as described in these cases corresponded with those observed in the beer poisoning cases, and I may here mention that it has been suggested that alcohol, being also a neurotic poison, may increase the toxic effect of arsenic.

Nature of illness

At this point it may be convenient to refer, very shortly, to the nature of the illness from which the patients suffered, as the Committee will then be able to appreciate why it was so difficult to arrive at its true origin.

Whatever the explanation may be, it would appear that the cases in this County, on the whole, have not been so serious as those which have occurred in Manchester and adjoining districts, and I have no official information of any deaths having occurred, although some patients have suffered, and are still suffering severely.

For the following summary of the symptoms usually met with I am indebted to the very full descriptions of cases in articles communicated to the medical journals by medical men practising in districts where they have mostly occurred, including Staffordshire; I have also personally observed the symptoms of patients whom medical practitioners have been good enough to afford me an opportunity of examining. I merely give the prominent ordinary symptoms, and I have avoided technicalities:—

The first signs and symptoms to make their appearance are usually dyspeptic troubles, headache, and irritation of the eyes, accompanied by a puffy condition of the lids and a watery discharge. The feet are swollen and tender, and there is a feeling of burning and tingling, so much so that patients insist upon keeping them uncovered; in many cases also, apart from paralytic trouble, patients are unable to walk on account of this tenderness. In many cases there is tenderness on

pressure of the calf, and in the severer cases there is paralysis, more or less complete, chiefly of the arms and legs. Various affections of the skin are met with which cause great irritation, and sometimes sores of various kinds cause considerable uneasiness, but the most characteristic skin affection is a hardened and scaly condition, especially of the hands and feet. Pigmentation or darkening of the skin is also frequently found on various parts of the body, including the face. This pigmentation, however, does not seem to have been so constantly met with in the Staffordshire cases as in those which occurred in Manchester and the neighbourhood. The circulation is feeble owing to weak action of the heart, and in some cases, although by no means in all, there is a rise of temperature.

Now, had the symptoms just enumerated been characteristic of arsenical poisoning only, the true nature of the phenomenal epidemic would not for so long have been overlooked, but, considering the fact that with the exception of the pigmentation of the skin—which is characteristic of arsenical poisoning, but which is not present in all cases, and is frequently only apparent when carefully looked for—all the symptoms are common both to the well-known ailment alcoholic peripheral neuritis and arsenical poisoning, it is by no means surprising that the true nature of the cases should have remained undiscovered for some months.

Dr. Reynolds, who, as I have already stated, was the first to throw light upon the mystery, had his suspicions aroused by observing pigmentation in several of his cases, and by noting that the cases occurred among beer drinkers and not among spirit drinkers, as is usual in the case of peripheral neuritis.

A list of the samples analysed is attached to this Report in the form of tables which also show the districts in which the samples were collected, and the result of the analysis in each case as regards the presence or absence of arsenic. Records have been kept both of the seller and brewer in all cases, but in the tables these are designated by distinctive letters and numbers, as it would not have accorded with the policy of the Committee to have particularised the sources of the samples in a report which is intended for publication.

Results of analyses.

It will be seen from the tables and the Report of the County Analyst, that of 140 samples of beers which were analysed, 15 were found to be decidedly arsenical, and seven very slightly so. Eleven samples of glucose and brewing and other sugars were also analysed, with the result that two only were found to be arsenical, both of which had been obtained from the same manufacturer, viz., Messrs. Bostock & Co.

As regards the 140 samples of beers which were analysed, I find from an analysis of the tabulated returns that they were collected in 28 different sanitary districts, from 140 distinct sellers, and that they represent the beers of 90 brewers, including 26 which were home-brewed. I may here mention that all the home-brewed beers collected were found to be free from arsenic.

It will be admitted, I think, considering the time which has been occupied in the work (about three weeks) that as much ground has been covered as was possible. Also, judging from the returns of cases of illness, and taking into account, in relation with these, the districts covered by the Inspectors, I am pretty well satisfied that the enquiry has been as complete as the circumstances dictated.

From the County Analyst's Report it will be seen that the amount of arsenic, in the form of arsenious oxide, present in the beers, varied from under $\frac{1}{20}$ th grain per gallon to just over $\frac{1}{2}$ grain.

Arsenic may give rise to poisonous symptoms when taken in one large dose or in continued small doses. Also, a dose which may cause symptoms of poisoning in one person may be taken with impunity by another—in fact, there are few drugs which act more diversely upon different people—and even when taken in medicinal doses, if continued for some time, arsenic not infrequently gives rise to symptoms which may become serious unless its use is discontinued.

The medicinal dose of arsenious oxide is from $\frac{1}{60}$ to $\frac{1}{12}$ gr. and, bearing in mind that some of the samples of beer contained as much as $\frac{1}{2}$ gr. per gallon, it follows that a little over one pint of such beer contained the maximum medicinal dose

of the drug. Probably the majority of people might take more than this amount, for a period, without injury, but, in view of what I have just stated, and considering the fact that thousands of people must have been drinking arsenical beer daily, one may reasonably conclude that among these there must have been a considerable number of persons who were hypersensitive to the drug. This being the case then, and supposing that only from one to two pints per person per day were consumed, one would not be surprised to meet with symptoms of, at least, mild arsenical poisoning. If, on the other hand, for pints we substitute quarts—which in all probability would be a truer estimate of the actual consumption among the class who have suffered—then, as the quantity of arsenic taken daily would much exceed the maximum medicinal dose, the recent calamitous experiences would at once be accounted for.

From time to time, as the enquiry proceeded and the analytical work progressed, the County Analyst notified the discovery of any arsenical samples to the Clerk of the County Council, who at once communicated with the sellers, cautioning them against the serious risks they ran unless they immediately ceased to sell the arsenical beer. It will be remembered that, after carefully considering the question, the Committee decided not to take proceedings under the Act unless in the unlikely event of a second offence, or if any person, after a reasonable time, was detected selling arsenical beer. Of course, now that the circumstances are well known to every brewer and publican in the kingdom, no leniency can be looked for if such beer is again discovered to be on sale.

Procedure on
discovery of
arsenical
samples.

It followed, as a matter of course, that the official caution sent to the beer-seller was passed on to the brewer, but, irrespective of this, I thought it advisable to call personally upon the implicated brewers in order to ascertain, if possible, what steps they had taken, or proposed to take, to stop the sale or consumption of all beer which had been brewed with the particular glucose which, by this time, was known to be the cause of the trouble. This was the only informa-

tion which, in the first instance, I hoped to obtain, and I must say I approached the brewers with a considerable amount of diffidence, not knowing, under the circumstances, how my visit might be received. As it turned out, however, I was received, without exception, with the utmost courtesy, and, besides obtaining the comparatively limited information sought for, I was supplied with further details which proved of the utmost value in elucidating certain circumstances attending the distribution of the cases of poisoning throughout the County which otherwise would have remained obscure. Of the thirteen brewers implicated, eight were in this County, four in an adjoining County, and one in Manchester. I visited all the breweries with the exception of the last-mentioned one, a visit to which I considered unnecessary, as the fullest inquiry into the matter was being made by the Medical Officer of Health of Manchester, with whom I had been in communication. I may here state that, with one exception, the implicated brewers had used glucose supplied by Messrs. Bostock & Co. The exception was one of the breweries in an adjoining County, and, upon further enquiry, I found that the public-house where the sample was obtained was not a tied house, and the probability is that the beer sold to the Inspector had been obtained from some other source. At any rate, the brewer who was supposed to be implicated assured me that he had only once used "Bostock" glucose, and that the small stock he had of it was exhausted more than twelve months ago. He also showed me the certificate of a well-known chemist testifying to the purity of all his beers and brewing materials.

Steps taken to
stop the sale
of arsenical
beer.

As regards the implicated brewers, I ascertained from each, step by step, the measures taken to put a stop to the sale of the arsenical beer. They also informed me as to the exact dates on which the steps were taken, and I had opportunities of verifying the information in most cases by documentary evidence in the shape of letters, telegrams, &c.

I need not go into detail regarding the steps which were taken by each firm, as a general account will, no doubt, be considered sufficient, especially as I am in a position to state

that in every case prompt action was taken, and I believe time will prove that the desired result has been attained.

It appears that soon after the scare arose, Messrs. Bostock & Co. communicated with some of their customers, asking them to discontinue brewing with the glucose they had supplied, as they had reason to doubt its purity, and that they would write again. After two or three days' interval, a second communication was received to the effect that the glucose might be used with safety, and immediately following this a third letter to say that the glucose, after all, was found to be arsenical, and that they would be glad to have it returned. I am glad to say that the brewers did not await the ultimate outcome of these vacillating communications, but took steps to satisfy themselves regarding the quality of the glucose by obtaining independent analyses, with the result that in every case the glucose was pronounced to be arsenical.

Upon this, prompt steps were taken to recall the arsenical beer, but, as may be imagined, this could not be accomplished in a day. In some cases the beer was immediately discharged into the sewers either on the spot or at the brewery. In other cases it was locked up either at the public-houses or at the brewery, to be destroyed in the presence of the Excise Officers, in the hope that the duty charged upon it will ultimately be rebated. As far as possible, private customers were also communicated with, and, on the whole, from what I could ascertain, I believe every effort was made to put a stop to the consumption of the arsenical beer, and at the present time I feel pretty confident that none is on sale. Possibly, for a little time minute traces of arsenic may still be found in beers, for the reason suggested by the County Analyst that the brewing vessels may impart slight contamination to the beers that are now being brewed from pure materials—in fact he suggests that this is the probable explanation of the traces of arsenic present in seven of the samples analysed—time, however, will remedy this, and, meanwhile, the amount of arsenic which can thus be imparted to beer is so infinitesimal that it may be disregarded from a health point of view.

Amount of glucose used in brewing.

Having regard to the fact that the use of arsenical glucose was the sole cause of the trouble, it is evident that the degree of contamination of the beer would vary in accordance with the amount of such glucose used by different brewers. In this respect the practice varies considerably, and the quantity has no fixed relationship to the amount of malt used. Among those brewers who have been good enough to supply me with the information, I find that the proportion of glucose used to malt varies from 12 to 33 per cent., and that the actual amount of glucose, say per barrel of beer, varies from 6·6lbs. to 22·4lbs., and this, when reduced to gallons, gives a range of from 2·9oz. to 9·9oz.

Such is the practice in the case of beers brewed for ordinary public-house consumption, but the reason for the extreme diversity in the amount of glucose used by different brewers is not very apparent. The brewers state that they brew to suit their customers, whose tastes are said to differ in different localities. In fact, one brewer informed me that the "fashion" in this respect differs so much, even in adjoining districts, that he is obliged to brew two distinct and very different qualities of beer to satisfy the wants of two artisan communities situated only a mile or two apart.

In the case of three of the implicated brewers, however, another factor came into play which still further accentuated the difference in degree of contamination of beers brewed by firms using Bostock's glucose. The three brewers in question had been in the habit of using, in the same brew, a mixture of glucoses, all of which, with the exception of Bostock's, were free from arsenic, and thus, in accordance with the total amount of glucose used, and the relative amount of the pure and impure article in the mixture, so the degree of impurity.

Given then a certain amount of arsenic in a certain glucose, used either alone or in combination with other non-arsenical glucoses, the degree of contamination of the beer would be regulated, first, by the amount of glucose used, and secondly, by the practice, when it is adopted, of mixing glucoses and the extent to which the mixing process is carried—in other words the amount of arsenical dilution effected by the mixing.

In the following table, particulars are given as to the amount of glucose (arsenical or otherwise) used in brewing beers for public-house consumption by eight of the 13 brewers whose beers were found to be arsenical. This information was obtained late in the enquiry, after all the brewers implicated (except the one in Manchester) had been visited, and it relates only to the implicated breweries within the County. Had the other brewers been applied to for this additional information it would, no doubt, have been supplied, but the facts already ascertained were sufficient for the purpose, and it was thought desirable not to delay the publication of the Report by a further extension of the enquiry.

Distinctive No.	Whether Bostock's Glucose only or Mixed.	Percentage Glucose to Malt.	Amount of Glucose per gallon.	
			Total.	Bostock's only.
56	Bostock's only	33	oz. 9.9	oz. 9.9
88	„ „	25	8.0	8.0
47	„ „	20	5.1	5.1
6	One-third Bostock's	20	5.6	1.8
3	One-half „	29	5.3	2.6
4	One-half „	18	4.5	2.2
78	Bostock's only	12	3.3	3.3
54	„ „	15 to 20	2.9	2.9

In view of what I have just stated, the comparative absence of arsenical poisoning cases in the populous towns in the north of the County is explained, for, although a large number of the public-houses in these towns were supplied with arsenical beer, it so happens that the implicated brewers not only used a moderate amount of glucose, but also lessened the arsenical quality of what they did use by brewing with mixed glucoses; thus, in the case of one large brewery the arsenical glucose was diluted to the extent of two-thirds,

Probable explanation of comparative absence of poisoning cases in North Staffordshire

and in two other cases to the extent of one-half. If in place of using mixed glucoses, the three brewers referred to had used Bostock's glucose only, the quantity of arsenical glucose per gallon of beer would have amounted to 4.5, 5.3, and 5.6 ozs. respectively, in place of 2.2, 2.6, and 1.8 ozs., the amounts actually used.

Use of arsenical glucose not explained by motives of economy.

It is popularly supposed that in using the special make of glucose which has led to such disastrous consequences, the brewers were influenced by economical motives, and it is but fair to them to point out that this was not the case. I believe the price paid for glucose varies from £12 to £9 10s. per ton, and the price actually paid for the glucose which was found to be arsenical was £11 10s. Both English and American glucoses are used, and it is only the latter which can be purchased at the cheapest rate. I found that one of the implicated brewers did use some American glucose, for which he paid £2 per ton less than that which he obtained from Bostock's. Believing the former to be inferior in quality to the latter, he only used it for brewing his low-priced beers, using the more expensive, and, as it turns out, arsenical glucose for his best beers. In another case, a brewer, in order to ascertain which make of glucose would be likely to prove most satisfactory, having regard to the character of the water used in brewing, &c., specially consulted a brewer's chemist on the subject, and it was upon his advice that he decided, in the first instance, to use Bostock's glucose.

Who is to blame?

Having regard to the County Analyst's remarks upon the chemical aspect of the question, the Committee will probably be of opinion that either the glucose or the sulphuric acid manufacturer, or both of them, must, to say the least of it, have been guilty of the grossest carelessness. The glucose manufacturer must have known, or should have known, that there are two qualities of sulphuric acid in the market, and that the impure quality is likely to contain arsenic. This being the case, it is but reasonable to suppose that in ordering the acid he would have specified the quality he required, and, considering the purpose for which it was intended, one cannot

conceive it possible that he would have ordered the inferior quality. Further than this, knowing, as he should have known, the serious risk involved, it would not have been unreasonable to have expected him to satisfy himself regarding the purity of each batch of acid supplied by having an analysis of it made upon delivery. On the other hand, as regards the manufacturer of the acid, supposing that the order specified the pure quality, in supplying the impure acid either a serious fraud was perpetrated or someone must have been guilty of the grossest carelessness. But, even supposing that the quality required was not specified in the order, and the acid manufacturer had been in the habit of supplying Messrs. Bostock & Co., it is hardly conceivable that he could have been ignorant of the purpose for which the acid was intended, and, that being the case, he might at least have made enquiry as to which quality was wanted before executing the order.

In concluding this Report I venture to predict that when, in accordance with the policy of the Committee, further samples of beer will shortly be collected for analysis, the new brews will be found to be free from arsenic.

GEO. REID.

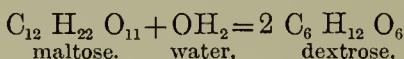
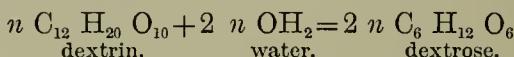
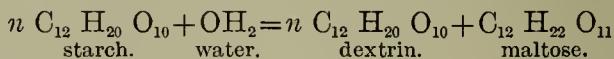
16th January, 1901.

County Analyst's Report.

As County Analyst, I beg to present the following report in reference to the above-mentioned matter, on the points suggested by the County Medical Officer.

The origin of this contamination, which has caused such consternation to the beer-drinking public, is the use of the malt substitute known commercially as glucose, which is a brewing sugar made from starch by the action of acid.

When starch is boiled with dilute acid its molecule splits up, and by the assimilation of water (known chemically as hydrolysis) is converted into soluble products mainly Dextrin (British gum), Maltose (malt sugar), and Dextrose (grape sugar), the relative proportions of which vary according to the condition and length of treatment, the two first-mentioned bodies gradually being converted into the last, which is the main product aimed at by the glucose maker.



The acid only induces these changes, and does not enter into combination.

On its being abstracted, it leaves a solution which on evaporation to a suitable concentration, furnishes a crystalline mass of grape sugar, known in commerce as glucose, its chief use being for brewing.

For liquid glucose the hydrolysis is not pushed so far, and evaporation is only carried to the extent of forming a syrup, which product is perhaps more largely used for jams, &c., than for brewing.

The hydrolytic action of the acid on the starch in the above-named process is similar to that brought about in the

process of mashing by the peculiar unorganised ferment of malt (diastase), which converts the starch of the malted barley into the soluble constituents of the wort, mainly Dextrin and Maltose.

The reason the glucose-maker carries his process so far is in order to hydrolyse as much of the Dextrin as possible, because that substance is not directly fermentable like Maltose and Dextrose, and what the brewer of light-bodied beer wants is directly fermentable matter unaccompanied by Dextrin.

Thus it will be recognised that the use in brewing of the properly chemically-prepared product, commercially known as glucose, is not of that dreadfully foreign and chemical nature which the public may have been led to imagine from the late unfortunate circumstances.

The main business reason for using glucose in brewing is because the beer fines sooner, and thus a quicker and larger trade can be done from the same-sized plant.

As to how arsenical contamination has arisen it will be remembered that to make the glucose the starch is treated with sulphuric acid, in the proportion of four per cent., suitably diluted, and then the acid is removed by treatment with chalk (carbonate of lime), forming sulphate of lime, which is insoluble enough to be filtered off.

If the sulphuric acid were pure no harmful matter would be left, but if the acid contained arsenic, as all ordinary pyrites acid does, then the arsenic would be left in the sugar solution, and so would be concentrated in the solid glucose.

Two samples of arsenical glucose (both made by the same firm) sent to me by the County Medical Officer, as having been used in this County, have been analysed and found to contain a little over 0.02 per cent. of arsenious oxide, so that the acid (3.3 per cent. on the glucose made) must have contained over 0.6 per cent. of arsenious oxide ; this is dreadfully impure oil of vitriol, and seems to cast the very gravest responsibility on someone either for supplying or for using it for such a purpose.

The fact is less excusable because it is so easy to remove the arsenic from sulphuric acid, and the price between non-arsenical and arsenical acid is less than five shillings per ton, which extra cost would mean only two or three-pence per ton on the glucose.

One hundred and forty beers have been analysed, of which 15 were found to be decidedly arsenical, and seven very slightly so.

Eleven glucoses, brewing, and other sugars have been examined, and two samples of glucose, both of the same make and from the same manufacturer, were found arsenical; all the other samples were free.

The amount of arsenious oxide in the contaminated beers has been found to vary from a mere trace—say well under one-twentieth grain per gallon—to just over half a grain per gallon. The mere traces were probably due to the contamination left in the utensils, &c., from the previous use of the arsenical glucose.

The smallness of the amount of arsenic to detect is perhaps better realised by stating that a twentieth of a grain per gallon is one part in one million four hundred thousand parts, an amount which is easily detected and confirmed by the method which has been employed in the tests for this report.

E. W. T. JONES,
County Analyst.

31st December, 1900.

ARSENIC IN BEER.
SAMPLES ANALYSED.
BEER SAMPLES.

Date of Collection.	Sanitary District.	Distinctive Letter or Number of Sample.	Brewery Distinctive No.	Arsenic present—Positive or Negative.
1900.				
Dec. 3	Longton	190 <u>P</u>	1	+
"	"	191 "	2	—
"	"	192 "	3	+
"	Fenton	193 "	4	+
"	Stoke-on-Trent	194 "	5	—
"		195 "	6	+
"	Brownhills	1	47	+
"	"	2	89	—
"	"	3	90	—
"	"	4	47	—
"	"	5	91	—
"	"	6	22	—
"	"	7	70	—
"	"	8	71	—
"	"	10	85	—
Dec. 4	"	15	19	—
"	"	16	87	—
"	"	24	50	—
"	Stoke-on-Trent	196 <u>P</u>	7	—
"	"	197 "	8	—
"	"	198 "	9	—
"	"	199 "	10	—
"	"	200 "	11	—
"	Burslem	14 <u>R</u>	12	—
"	Stoke-on-Trent	15 "	13	—
"	Burslem	16 "	14	—
"	"	17 "	15	—
"	"	18 "	16	—
"	"	19 "	17	—
"	"	21 "	18	—
Dec. 5	"	22 "	19	—
"	"	23 "	20	—
"	Stoke-on-Trent	24 "	19	—
"	Fenton	25 "	21	—
"	"	26 "	14	—
"	Bilston	77 <u>W</u>	51	—
"	"	78 "	1	—
"	"	79 "	19	—
"	"	80 "	52	—
"	"	81 "	53	—
"	Wednesbury	82 "	54	+
"	"	83 "	55	—
"	"	84 "	56	+
"	"	85 "	57	—
Dec. 6	Tipton	86 "	47	+
	"	87 "	58	—

Date of Collection.	Sanitary District.	Distinctive Letter or Number of Sample.	Brewery Distinctive No.	Arsenic present—Positive or Negative.
Dec. 6	Tipton	88 <u>W</u>	59	—
"	"	89 "	60	—
"	"	90 "	61	—
Dec. 7	Fenton	27 <u>R</u>	5	—
"	Longton	28 "	22	—
"	"	29 "	8	—
"	Cheadle (Rural) ...	30 "	23	—
"	" "	31 "	24	—
"	" "	32 "	5	—
"	Longton	33 "	5	—
"	"	34 "	5	—
"	"	35 "	1	—
"	Stone (Rural) ...	36 "	25	—
"	Stone	37 "	5	—
"	"	38 "	5	—
"	"	39 "	3	+
		<u>C</u>		
"	Kingswinford (Rural) ...	91 <u>W</u>	62	—
"	"	92 "	63	—
"	"	93 "	64	—
"	"	94 "	65	—
"	"	95 "	66	—
"	"	96 "	19	—
		<u>A</u>		
Dec. 8	Newcastle (Rural) ...	40 <u>R</u>	10	—
"	"	41 "	26	+
"	Blore Heath (Rural) ...	42 "	9	—
"	"	43 "	27	+
"	"	44 "	28	+
"	Stone (Rural) ...	45 "	16	—
		<u>C</u>		
"	Bilston	97 <u>W</u>	5	—
"	"	98 "	56	—
"	Darlaston	99 "	54	—*
"	"	100 "	54	+
"	"	101 "	47	+
"	"	102 "	56	—
"	Willenhall	103 "	1	—
"	"	104 "	67	—
"	"	105 "	68	—
		<u>A</u>		
Dec. 9	Stone (Rural) ...	46 <u>R</u>	29	—
"	Gnosall (Rural) ...	47 "	30	—
"	"	48 "	31	—
"	"	49 "	32	—
Dec. 10	Stone (Rural) ...	50 "	33	—
"	"	51 "	16	—
"	Gnosall (Rural) ...	52 "	34	—
"	"	53 "	35	+
"	"	54 "	36	—
"	"	55 "	37	—
"	"	56 "	38	—
"	"	57 "	39	—

Date of Collection.	Sanitary District.	Distinctive Letter or Number of Sample.	Brewery Distinctive No.	Arsenic present—Positive or Negative.
Dec. 10	Wednesfield ...	106 <u>C</u> 107 <u>W</u>	1	—
	" ...	108 "	19	—
	Cannock (Rural)	108 "	69	—
	Walsall (Rural)	109 "	47	+"*
	" "	110 "	3	+"*
	" "	111 "	70	—
		<u>C</u>		
	Tamworth ...	1 <u>X</u>	71	—
	" ...	2 "	72	—
	Tamworth (Rural)	3 "	73	—
Dec. 11	Cannock (Rural)	<u>A</u>		
		<u>R</u>	87	—
	Wednesbury ...	112 <u>C</u> 113 <u>W</u>	74	—
	" ...	114 "	75	—
	" ...	115 "	76	—
	" ...	116 "	54	—
	" ...	117 "	77	—
	" ...	118 "	8	—
	" ...	119 "	78	+"*
	Lichfield (Rural)	120 "	79	—
Dec. 13		<u>A</u>		
	Wolstanton (Rural)	58 <u>R</u>	40	—
	Longton	59 "	41	—
	Stafford	60 "	42	—
	"	61 "	43	—
	"	62 "	44	—
	"	63 "	45	—
	"	64 "	46	—
	"	65 "	47	+
	"	66 "	48	—
Dec. 14	"	67 "	49	—
	"	68 "	50	—
	Wolstanton (Rural)	101 "	6	+"*
	"	102 "	6	+"*
	Stoke-on-Trent	103 "	3	+"*
Dec. 15		<u>C</u>		
	Wednesbury ...	121 <u>W</u>	56	—
	" ...	122 "	81	—
	" ...	123 "	54	—
Dec. 17	Seisdon (Rural)	4 <u>X</u>	82	—
	" "	5 "	61	—
	" "	6 "	83	—
	" "	7 "	84	—
	" "	8 "	85	—
	" "	9 "	20	—
Dec. 20		<u>A</u>		
	Newcastle (Rural)	121 <u>R</u>	19	—
Dec. 21	Stone (Rural)	123 "	5	—
"	Willenhall	10 <u>X</u>	86	—

* Very minute trace.

GLUCOSE SAMPLES.

Date of Collection.	Sanitary District.	Distinctive Letter or No. of Sample.	Source from which obtained.	Arsenic Present—Positive or Negative.
1900. Dec. 3	Brownhills... ...	18	92	—
," "	,"	19	92	—
," "	,"	20	92	—
," "	,"	21	92	—
," "	,"	22	93	—
," 7	Lichfield	A	47	+
," "	,"	B	47	—
," "	,"	C	47	—
," 9	Newcastle	D	94	—
," 10	Bilston	E	88	+
," 12	Newcastle	F	95	—

STAFFORDSHIRE COUNTY COUNCIL.

ARSENIC IN BEER.

Approximate number of Cases of Poisoning, 667.

SPOT MAP, showing distribution of Cases.

January, 1901.



REFERENCES.

Urban Districts	...	...	Shaded.
County Boroughs	...	...	Coloured Yellow.
Arsenical Poisoning Cases	..		Red Spots.

STAFFORDSHIRE COUNTY COUNCIL.

SUMMARY OF NOTIFICATION RETURNS.

Cases Notified during the Week ending
9th March, 1901.

The prevalence of certain diseases not Notifiable is indicated as follows:—

A FEW CASES. X: PREVALENT, XX; VERY PREVALENT, XXX.

Population. CENSUS 1931	Cholera.	Diphtheria.	Croup.	Erysipelas.	Scarlet Fever.	Typhus.	Buntes.	Relapsing.	Doubtful.	Puerperal.	Measles.	Whooping Cough.	Diphtheria.	Influenza.	Diarrhoea.	DISEASES PREVALENT		W. J. Dawes, M.R.C.S.	
																FEVERS.			
Longton	34,327	—	—	1	—	2	8	—	2	—	—	—	—	—	—	—	—	—	W. J. Dawes, M.R.C.S.
Newcastle	18,452	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. Webb, M.R.C.S.
Perry Barr	2,310	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Jas. Richmond, M.B., D.P.H.
Quarry Bank	6,732	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	T. M. Tibbets, M.B., D.P.H.
Rowley Regis	30,791	—	—	—	2	1	1	—	—	—	—	—	—	—	—	—	—	—	J. G. Beasley, L.R.C.P.
Rugeley	4,181	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. H. Freer, L.R.C.P.
Sedgley	14,961	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Biggian, M.D.
Short Heath	2,514	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. T. Hartill, L.R.C.P.
Smallthorne	5,279	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Aspinall, M.R.C.S.
Smethwick	36,170	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. F. Marsh Jackson, L.R.C.P.
Stafford	* 20,270	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	F. M. Blumer, M.B.
Stoke-on-Trent	24,027	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G. Petgrave Johnson, M.D., D.P.H.
Stone	5,754	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. Ferrie, M.D.
Tamworth	6,614	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. J. Fausset, M.D.
Tettenhall	5,145	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. H. T. Winter, L.R.C.P.I.
Tipton	29,314	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. S. Underhill, M.D., D.P.H.
Tunstall	15,730	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. Partington, M.B.
Uttōxeter	4,800	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	B. H. Herbert, M.R.C.S.
Walsall (C.B.)	71,791	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Scott Wilson, M.D., D.P.H.
Wednesday	25,347	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. C. Garman, M.D.
Wednesfield	4,949	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. Hands, L.R.C.P.
West Bromwich (C.B.)	59,489	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. H. H. Manley, M.B., D.P.H.
Willenhall	16,852	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. T. Hartill, L.R.C.P., M.R.C.S.
Wolverhampton (C.B.)	82,620	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Henry Malet, M.D.

* Including Public Institutions.

Rowley Regis—Mumps, xx.

Tunstall—Mumps, xx.

Willenhall—Chicken-pox, x.

RURAL.	Population. CENSUS 1891.	FEVERS.										DISEASES PREVALENT										Medical Officer of Health	
		Smallpox	Cholera.	Diphtheria	Group.	Brysipelas.	Typhus.	Scarlet Fever.	Brysipelas.	Group.	Cholera.	Diphtheria	Smallpox	Cholera.	Diphtheria	Smallpox	Cholera.	Diphtheria	Smallpox	Cholera.	Diphtheria	Smallpox	
Blare Heath	2,227	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. Macqueen, M.D.
Cannock	15,894	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. Hosegood, M.B.
Cheadle	22,302	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. L. Webb, M.R.C.S.
Eccleshall	5,698	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. W. Gosse, L.R.C.P.
Gnosall	4,366	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R. S. Steele, M.B.
King'swinford	17,848	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G. Grindlay, M.B.
Leek	13,998	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	T. E. Dakeyne, L.R.C.P.
Lichfield	23,299	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Clark, M.D.
Mayfield	4,160	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. Hall, M.R.C.S.
Newcastle	6,174	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R. H. Dickson, L.R.C.P.I.
Seisdon	12,371	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. R. Spackman, L.R.C.P.
Stafford	10,320	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S. Butler, L.F.P.S.G.
Stoke-on-Trent	5,122	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. S. Walker, M.D.
Stone	8,174	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. Fermie, M.D.
Tamworth	4,770	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. J. Fausset, M.D.
Tutbury	9,031	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	K. D. B. Dobbs, L.R.C.P.I.
Uttōxeter	7,227	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	B. H. Herbert, M.R.C.S.
Walsall	9,319	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	G. Martin Fox, L.R.C.P., D.P.H.
Wolstanton	32,773	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	T. McKay Youngson, M.B.

† Including Burntwood Asylum.
Seisdon—Chicken-pox, xx.

Stafford,

12th March, 1901.

GEORGE REID,
County Medical Officer.

STAFFORDSHIRE COUNTY COUNCIL.

SUMMARY OF NOTIFICATION RETURNS.

Cases Notified during the Week ending
12th October, 1901.

The prevalence of certain diseases not Notifiable is indicated as follows:—

A FEW CASES, X; PREVALENT, XX; VERY PREVALENT, XXX.

URBAN.	Population. CENSUS 1901.	Smallpox.	Cholera.	Diphtheria.	Scarlet Fever.	Typhus.	Enteric.	Relapsing.	Contiguous.	Puerperal.	Measles.	Whooping Cough.	Pneumonia.	Influenza.	Diphtheria.	DISEASES PREVALENT.		Medical Officer of Health	
																REVERS.			
Ambleside	3,128	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. D'Arcy Ellis, L.R.C.P.
Audley	13,679	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Jno. Vernon, M.B.
Biddulph	6,247	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	T. W. H. Garstang, M.R.C.S., D.P.H.
Bilston	24,034	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	T. Ridley Bailey, M.D.
Brierley Hill	12,040	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. D'Arcy Ellis, L.R.C.P.
Brownhills	15,252	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. C. Maddever, M.D.
Burslem	38,766	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	C. H. Mott, M.R.C.S.
Burton (C.B.)	50,386	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Harold Coates, M.D., D.P.H.
Cannock	23,992	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. N. Phillips, M.R.C.S.
Coseley	22,218	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. M. Clendinnen, L.R.C.P.
Darlaston	15,391	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S. Partridge, M.D.
Fenton	22,742	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. V. Griffiths, M.R.C.S.
Handsworth	52,921	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Jas. Richmond, M.B., D.P.H.
Hanley (C.B.)	61,524	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	John Clare, L.R.C.S., D.P.H.
Heath Town	9,441	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Green, M.R.C.S.
Kidsgrave	4,551	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Steele, L.R.C.P.
Leek	15,484	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Mountfort Johnson, M.D.
Lichfield	7,902	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	J. Clark, M.D.

Leek—Chicken pox, x.

Population. CENSUS 1901	FEVERS.		DISEASES PREVALENT		Medical Officer of Health	
	Scarlet Fever.	Typhus.	Measles.	Whooping Cough.	Influenza.	Diphtheria.
Longton	35,825	-	1	-	-	W. J. Dawes, M.R.C.S.
Newcastle	19,914	-	1	-	-	F. Webb, M.R.C.S.
Perry Barr	2,348	-	2	-	-	Jas. Richmond, M.B., D.P.H.
Quarry Bank	6,912	-	5	-	-	T. M. Tibbets, M.B., D.P.H.
Rowley Regis	34,669	-	-	x	xx	J. G. Beasley, L.R.C.P.
Rugeley	4,447	-	-	-	-	J. H. Freer, L.R.C.P.
Sedgley	15,951	-	1	-	-	J. Biggarn, M.D.
Short Heath	3,531	-	-	-	-	J. T. Hartill, L.R.C.P.
Smallthorne	6,263	-	1	-	-	J. Aspinall, M.R.C.S.
Smethwick	54,560	-	2	-	-	W. F. Marsh Jackson, L.R.C.P
Stafford	* 20,894	-	27	-	-	F. M. Blumer, M.B.
Stoke-on-Trent	30,456	-	6	-	xx	G. Petgrave Johnson, M.D., D.P.H.
Stone	5,680	-	-	-	-	E. Fernie, M.D.
Tamworth	7,271	-	-	-	-	H. J. Fausset, M.D.
Tettenhall	5,337	-	-	-	-	W. H. T. Winter, L.R.C.P.I.
Tipton	30,543	-	2	-	x	A. S. Underhill, M.D., D.P.H.
Tunstall	19,492	-	2	-	-	W. Partington, M.B.
Uttoxeter	5,133	-	-	1	-	B. H. Herbert, M.R.C.S.
Walsall (C.B.)	86,440	-	-	6	2	J. Scott Wilson, M.D., D.P.H.
Wednesbury	26,544	-	-	7	-	W. C. Garman, M.D.
Wednesday	4,883	-	-	-	-	A. Hands, L.R.C.P.
West Bromwich (C.B.)	65,172	-	1	-	-	J. H. H. Mauley, M.B., D.P.H.
Willenhall	18,513	-	2	1	-	J. T. Hartill, L.R.C.P., M.R.C.S.
Wolverhampton (C.B.)	94,179	-	4	15	1	Henry Malet, M.D.
				x	x	xx

* Including Public Institutions. † Imported.

Willenhall—Chicken-pox, x.

RURAL.	Population. CENSUS 1901.	DISEASES PREVALENT										Medical Officer of Health	
		Smallpox.	Cholera.	Diphtheria.	Scarlet Fever.	Typhus.	Enteric.	Hæmorrhage.	Measles.	Whooping Cough	Pneumonia	Influenza.	
Blore Heath	2,141	—	—	—	—	—	—	—	—	—	—	—	A. Macqueen, M.D.
Cannock	17,857	—	—	—	—	—	—	—	—	—	—	—	W. Hosegood, M.B.
Cheadle	24,657	—	—	—	—	—	—	—	—	—	—	—	H. L. Webb, M.R.C.S.
Eccleshall	5,734	—	—	—	—	—	—	—	—	—	—	—	H. W. Gosse, L.R.C.P.
Gnosall	4,697	—	—	—	—	—	—	—	—	—	—	—	R. S. Steele, M.B.
Kingswinford	19,514	4	—	—	—	—	—	—	—	—	—	—	G. Grindlay, M.B.
Leek	—	—	—	—	—	—	—	—	—	—	—	—	T. E. Dakeyne, L.R.C.P.
Lichfield	—	—	—	—	—	—	—	—	—	—	—	—	J. Clark, M.D.
Mayfield	—	—	—	—	—	—	—	—	—	—	—	—	A. Hall, M.R.C.S.
Newcastle	—	—	—	—	—	—	—	—	—	—	—	—	R. H. Dickson, L.R.C.P.I.
Seisdon	6,513	—	—	—	—	—	—	—	—	—	—	—	H. R. Spackman, L.R.C.P.
Stafford	—	—	—	—	—	—	—	—	—	—	—	—	S. Butler, L.F.P.S.G.
Stoke-on-Trent	—	—	—	—	—	—	—	—	—	—	—	—	J. S. Walker, M.D.
Stone	—	—	—	—	—	—	—	—	—	—	—	—	E. Ferrie, M.D.
Tamworth	—	—	—	—	—	—	—	—	—	—	—	—	H. J. Fausset, M.D.
Tutbury	—	—	—	—	—	—	—	—	—	—	—	—	K. D. B. Dobbs, L.R.C.P.I.
Uttōxeter	—	—	—	—	—	—	—	—	—	—	—	—	T. Bamford, M.R.C.S.
Walsall	—	—	—	—	—	—	—	—	—	—	—	—	G. Martin Fox, L.R.C.P., D.P.H.
Wolstanton	—	—	—	—	—	—	—	—	—	—	—	—	T. McKay Youngson, M.B.

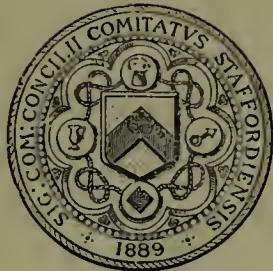
† Including Burntwood Asylum.

Stafford,

15th October, 1901.

GEORGE REID,

County Medical Officer.



STAFFORDSHIRE COUNTY COUNCIL.

ISOLATION HOSPITAL PROVISION.

MEMORANDUM

BY

COUNTY MEDICAL OFFICER.

OCTOBER, 1901.

ISOLATION HOSPITAL PROVISION.

Memorandum by County Medical Officer.

As the District Councils are already aware, the County Council have decided to put in operation, if need be, the powers they possess in order to secure the provision of proper hospital accommodation for the isolation of infectious cases in those districts of the county in which they have statutory powers under the Isolation Hospital Acts of 1893 and 1901. These powers are limited to the Urban and Rural Districts in the Administrative County exclusive of Municipal Boroughs, at the same time, provision exists for Boroughs being formed into hospital areas, or included in areas which may be formed, if it is their wish to be so formed or included. It is to be hoped that the various Corporations will duly consider the question in this light, as both from their point of view as well as from the point of view of the County as a whole, it is desirable that they should co-operate in the movement.

While the County Council have no desire to supersede local initiative, it is obvious that in many cases the districts are too small to be able to provide the necessary accommodation singly without incurring a prohibitive expenditure. It is for this reason that the Council hope to be able to induce Authorities to unite to form joint areas of such a size as will bring both the capital and annual expenses within reasonable limits.

As the result of several conferences between Local Authorities and the Hospital Sub-Committee of the County Council, and numerous interviews between representatives of District Councils and the County Medical Officer, the prevailing opinion is now undoubtedly in favour of union of districts; in fact negotiations had reached such an advanced stage some time

ago that in several cases Local Inquiries were about to be held, and had it not been discovered that there were legal difficulties which prevented the general application of the policy of the County Council as regards contributions, a considerable number of districts would by this time have been equipped with efficient isolation hospital accommodation.

The Amending Act of 1901 having removed all the difficulties referred to, nothing now stands in the way of a resumption of the negotiations between the County Council and Local Authorities.

Of course, in the formation of hospital areas, the important question of accessibility from all parts to a centre, where the hospital will stand, must outweigh all other considerations, but it so happens, owing to the grouping of the population in the north and south of the County, that Staffordshire is peculiarly well adapted to the formation of joint areas embracing large populations within a comparatively short radius. That this is so will be seen from the accompanying map and tables, showing, merely as a tentative suggestion, what would appear to be convenient groupings, provided suitable sites can be found within the respective joint areas. On the other hand, there are wide and sparsely populated areas in the County where grouping, for general isolation purposes, may be found to be impracticable, and where even one hospital for one district will hardly be possible. In such cases provision will probably have to be made by adapting for the purpose existing houses situated at convenient points.

As regards the isolation of small-pox cases, entirely separate buildings are essential, but in this case it is practicable to provide for a very much larger area by means of one hospital than is possible in the case of other infectious diseases, because, as a rule, small-pox patients may, without injury, be conveyed much longer distances. This being the case, and as the accommodation for small-pox cases, so far as permanent buildings are concerned, need not equal what may occasionally, and under exceptional circumstances, be required, the

ISOLATION HOSPITAL AREAS.

Table shewing proposed Total Accommodation and the number of Beds to be provided for General and for Small-pox Cases.

District.	Population, 1901 Census.	Area No.	General.		Small-pox.	
			Population of Area.	Beds.	Population of Area.	Beds.
Smethwick...	54,560					
Handsworth	52,921	I.	109,829	90		
Perry Barr...	2,348					
Quarry Bank	6,912	II.				
Brierley Hill	12,040		84,164	65		
Rowley Regis	34,669					
Tipton	30,543					
Amblecote ...	3,128	III.				
Kingswinford (Rural)	19,514		29,091	20		
Half Seisdon (Rural)	6,449					
Tettenhall ...	5,337	IV.				
Half Seisdon (Rural)	6,448		49,954	40	385,665	30
Sedgley ...	15,951					
Coseley ...	22,218					
Heath Town	9,441	V.				
Wednesfield	4,883		112,627	90		
Short Heath	3,531					
Willenhall ...	18,513					
Bilston	24,034					
Darlaston ...	15,391					
Wednesbury	26,544					
Walsall (Rural)	10,290					
Tamworth ...	7,271	VI.				
Tamworth (Rural)	5,497		12,768	8*		
Lichfield ...	7,902	VII.				
Lichfield (Rural)	25,716		38,065	24	50,833	6
Rugeley ...	4,447					
Cannock ...	23,992	VIII.				
Cannock (Rural)	17,857		57,101	40	57,101	6
Brownhills...	15,252					
Uttoxeter (Urban)	5,133	IX.				
Half Uttoxeter (Rural)	4,064		18,334	16	18,334	4
Tutbury (Rural) ...	9,137					
Stafford ...	19,340	X.				
Stafford (Rural) ...	10,403		34,440	25	34,440	6
Gnosall (Rural) ...	4,697					
Cheadle (Rural) ...	24,657	XI.				
Half Uttoxeter (Rural) ...	4,064		32,774	20	32,774	4
Mayfield (Rural) ...	4,053					
Stone (Rural) ...	13,959	XII.				
Stone (Urban) ...	5,680		21,780	18	21,780	4
Blare Heath (Rural)	2,141					
Stoke ...	30,456	XIII.				
Fenton ...	22,742		93,831	80		
Longton ...	35,825					
Stoke (Rural) ...	4,808					
Audley ...	13,679	XIV.				
Newcastle ...	19,914		40,106	30		
Newcastle (Rural) ...	6,513				246,227	20
Biddulph ...	6,247	XV.				
Kidsgrove ...	4,551					
Wolstanton (Rural)	36,971		112,290	90		
Tunstall ...	19,492					
Burslem ...	38,766					
Smallthorne ...	6,263					
Leek (Urban) ...	15,484	XVI.				
Leek (Rural) ...	13,868		29,352	20	29,352	4
TOTALS	876,506	16	876,506	676	876,506	84

* This number refers to the area within Staffordshire and it is taken for granted that the Warwickshire part of the Tamworth Rural District would form part of the area with, say, 16 as the total number of beds.

expenditure involved would be comparatively trifling. So far as the permanent structure is concerned, a good-sized administrative block, and a comparatively small number of beds would serve for a considerable population, providing arrangements were made for the rapid erection of temporary buildings on the same site should occasion arise.

Without going into detail, which has already been done in previous reports, the present isolation hospital accommodation in the County, both as regards extent and character, may be said to come lamentably short of the requirements.

In arriving at the requirements of the County, a standard of 2,000 cubic feet and a floor space of 144 square feet per bed should be adopted, and as regards the number of beds to be provided, a distinction may be drawn between urban and rural districts. Ultimately it will probably be found needful to provide accommodation on the basis of at least one bed per 1,000 persons in urban districts, and one bed per 1,500 in rural districts, but, for the present, and until isolation of infectious cases becomes a routine practice—as, in time, it no doubt will—it may be thought expedient to curtail the number of beds somewhat. In framing the table setting forth the number of beds for each area, regard has been paid to this consideration, but it must be understood that sufficient administrative accommodation should be provided, in the first instance, to allow of future economical extension of the ward blocks. In arriving at the suggested number of beds, it has been taken for granted that joint areas will be formed; it is obvious, however, that if the smaller districts determine to make separate provision, the proportion of beds to population would have to be greatly increased, having regard to the fact that two sexes and several diseases have to be provided for.

As an index of the economy which would be effected, in the capital outlay alone, by the union of districts, I have estimated the total number of beds which would be required for the Administrative County in the event of each district determining to make separate provision, and even if the number were reduced to the lowest possible limit, and leaving

out of the question provision for isolating smallpox cases, it cannot be reckoned at less than 1,020, as compared with 676 the estimated number in the case of the joint area scheme. In other words, even allowing that the accommodation could be provided at the same cost per bed in both cases—which it is obvious it could not—for every £1,000 spent on the combination system, £1,500 would have to be spent on the separate system, a difference which, of course, would be still more pronounced if provision for smallpox isolation were included in the calculation.* On the whole, therefore, and considering the fact that the cost per bed of erecting small as compared with large hospitals would be considerably greater, the probability is that if individual authorities were to provide the needful accommodation the capital outlay would be nearly doubled. This, in itself, is a strong argument in favour of joint areas, but as it must also be admitted that well-administered large hospitals are more efficient, and, *pro rata*, less costly to maintain than small ones, the argument in favour of joint areas seems unanswerable.

As regards the cost of the buildings, exclusive of site and furniture, size, as I have said, plays an important part, and when this matter was very carefully gone into a few years ago, the conclusion arrived at was that, even with the strictest economy in every detail, the minimum could not be reckoned at less than £220 per bed in the case of the larger buildings, and £250 in the case of the smaller ones. Since then, however, the cost of building has increased, owing to a rise in prices all round, and it is now likely that these estimates may be exceeded, although not materially so.

As regards the working expenses, it is difficult to obtain sufficient data to allow of a reliable estimate being made, but as the Authorities may take it for granted that the County Council intend that, so far as their responsibility

* If the isolation of smallpox is also taken into account in this estimate, the number of beds in the case of joint and single areas would be 760 and 1308 respectively, and for every £1,000 expended in the former case £1,720 would have to be spent in the latter.

ISOLATION HOSPITALS ACT, 1893

MAP SHOWING SUGGESTED HOSPITAL AREAS
IN THE COUNTY.

OCTOBER, 1901.



*County Boroughs not included in Scheme,
but arrangements could be made for
their inclusion.

REFERENCES

BOUNDARIES OF DISTRICTS	..	BLACK	
GENERAL ISOLATION AREAS	..	RED	
SMALL-POX	DITTO	..	GREEN
URBAN DISTRICTS	..	SHADED	
* COUNTY BOROUGHS	..	COLOURED YELLOW	

extends under the Act, the County shall be properly equipped with isolation accommodation, it is now no longer a question of hospital or no hospital; therefore, the expenditure, whatever it may be, must be incurred, and as it is obvious that the cost of maintenance would be proportionately higher in the case of small as compared with large hospitals, on economical grounds, apart from other considerations, the union of districts is indicated. At the same time, the County Council have no desire to press Authorities unduly, and granting that proper provision is made, either through individual or joint action, the promised assistance in the shape of contributions from the County Funds towards the working expenses of a sum equal to one-third the total will be forthcoming. This contribution, however, will be contingent upon the proper use and maintenance of the buildings and appliances, and upon the County Council retaining the right to elect, from among their members, or otherwise, as they think fit, one-fourth of the members constituting the Hospital Boards.

With regard to the initial steps for putting the Act in operation in any locality, the County Council—in response to an application by one or more Local Authorities, or by 25 rate-payers in a "contributory place," or upon a report by the County Medical Officer—having made inquiry and come to the conclusion that there is need for increased hospital accommodation in any particular locality, may direct that such accommodation shall be provided for one district or for several districts jointly. Having constituted a hospital district, the County Council would next proceed to form the Committee of Management, in whom would be vested such powers of acquiring land and providing hospital accommodation, by purchase or otherwise, as the Council shall delegate to them.

Of course, in forming a Hospital Area, among other details, such questions as the constitution of the Board as regards the proportionate representation assigned to each constituent district, if the area is a joint one, and the basis of adjustment of the expenditure (capital and annual) between each district contributing will, to some extent, be regulated by

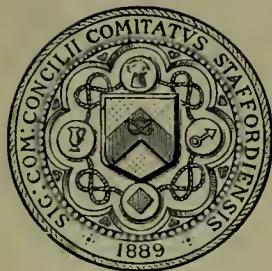
circumstances, and can only be satisfactorily settled by weighing the arguments for and against any proposals that may be brought forward at the inquiry. As a general principle, however, it would seem that population and not rateable value should be the controlling factor ; also, that, for the reason indicated in dealing with the requirements, a distinction should be drawn between Urban and Rural Districts, every 1,000 of the urban population being considered equivalent to 1,500 of the rural.

GEO. REID, M.D., D.P.H.,

County Buildings,

County Medical Officer.

Stafford, October, 1901.



STAFFORDSHIRE COUNTY COUNCIL.

ANNUAL REPORT

OF THE

MEDICAL OFFICER OF HEALTH,

GEORGE REID, M.D., D.P.H.,

FOR THE YEAR 1900

STAFFORD

J. & C. MORT, PRINTERS, 39, GREENGATE STREET.

1901.

INDEX.

Page.	Page.	
Adoptive Acts 103	Birth-rate	11-13
Ambleside—	Brierley Hill—	
Excrement and refuse disposal in 73	Dairies, cowsheds, and milk-shops in 99	
Isolation of infectious cases in 49	Enteric fever in 41	
Analyses of effluents and streams ... 3	Excrement & refuse disposal in 76	
Area and population 10	High death-rate in 17	
Arsenic in Beer 103	Housing of the working classes in 68	
Arsenical beer inquiry 8	Insanitary dwellings in ... 68	
Audley—	Isolation of infectious cases in 50	
Excrement & refuse disposal in 73	Lower infant mortality in ... 20	
Sewerage & sewage disposal in 85	Slaughter houses in 96	
Bacteriological examinations in suspected cases of diphtheria, enteric fever, and phthisis ... 8	Vaccination in 63	
Bakehouses 98	Water-supply of 89	
Biddulph—	Brownhills—	
Congleton peat pail system in 74	Excrement & refuse disposal in 77	
Dairies, cowsheds, and milk-shops in 98	High death-rate in 17	
Isolation of infectious cases in 49	Insanitary dwellings in ... 70	
Vaccination in 62	Isolation of infectious cases in 49	
Bilston—	Measles in 29	
Diarrhoeal diseases in 45	Water-supply of 89	
Diminished birth-rate in 12	Burslem—	
Diphtheria and bacteriological diagnosis scheme 31	Isolation of infectious cases in 50	
Enteric fever in 40	Privy system in 77	
Excrement & refuse disposal in 74	Burton-on-Trent—	
High infant mortality in 19	Antitoxin treatment of diphtheria 31	
Insanitary dwellings and over-crowding in 67	Dairies, cowsheds, and milk-shops in 99	
Isolation of infectious cases in 49	Low birth-rate in 12	
Measles in 27	Bye-laws, &c. 102	
Vaccination in 63	Canal Boats 101	
Birmingham Tame and Rea Sewage Works 4	Cannock—	
	Enteric fever in 41	
	Isolation of infectious cases in 50	
	Sewerage and sewage disposal in 85	

	Page.		Page.
Cannock (Rural)—			
Enteric fever in ...	43	Effluents, Analyses of	3
Isolation of infectious cases in	60	Enteric fever ...	40—44
Legal proceedings in a case of diphtheria ...	37	Bacteriological examinations in suspected cases of ..	8
Vaccination in ...	66	Erysipelas ...	45
Water-supply in ...	92	Excrement and refuse disposal	73—84
Cheadle (Rural)—		Experiments in sewage disposal ..	5
Diphtheria and value of bacteriological diagnosis scheme	38	Factories and Workshops ...	101
Water-supply in...	93	Fenton—	
Chemical works, Pollution from	5	Hospital isolation for diphtheria cases inadequate ..	32
Cholera ...	45	Infant mortality in ...	22
Consultations ...	9	Isolation of infectious cases in	52
Coseley—		Privy system in...	78
Damp houses in ...	70	Success of antitoxin treatment of diphtheria ..	32
Diphtheria and bacteriological diagnosis scheme	31	Galvanizers' Waste, Disposal of ...	4
Enteric fever in ..	41	Gnosall (Rural)	
High death-rate in ...	17	Water-supply in ...	93
Infant mortality in ...	21	Handsworth—	
Isolation and disinfection in ...	51	Causes of fatal diarrhoea in ...	45
Vaccination in ...	64	Disinfection of clothing, &c. in	52
Dairies, cowsheds, and milk-shops ...	98—101	Excrement & refuse disposal in	78
Darlaston—		Infant mortality in ..	22
Death-rate from diarrhoea in ...	45	Influenza in ...	46
Enteric fever in ...	42	Phthisis in ...	47
Excrement & refuse disposal in	77	Vaccination in ...	64
Infant mortality in ...	21	Heath Town—	
Influenza in ...	46	Excrement disposal in ...	78
Isolation of infectious cases in		Isolation of infectious cases in	52
	49, 51	Sewerage of ...	85
Death-rates—		Housing of the working classes	67—73
In urban and rural districts	13—18	Infant mortality ...	18—25
Diarrhoea ...	44	Infant mortality and factory labour	24
Diphtheria, Bacteriological examinations in suspected cases of	8	Influenza ...	45
Diphtheria ...	31	Insanitary dwellings & overcrowding ...	67—73
Eccleshall (Rural)—		Introductory remarks ..	1
Antitoxin treatment and bacteriological diagnosis of diphtheria cases ...	38	Kidsgrove—	
Infant mortality in ...	23	Isolation of infectious cases in	52
Water-supply in...	93		

	Page.		Page.
Kingswinford (Rural)—			
Enteric fever and bacteriological diagnosis scheme	44	Phthisis, Bacteriological examinations in suspected cases of	8
Legal proceedings in case of scarlet fever	30	Phthisis	47
Measles in	29	Pollution from Chemical Works	5
Sewerage and sewage disposal in	88	Pollution of streams—	
Water-supply in	93	Work of Committee	3—6
Leek—		Population and Area	10
Diphtheria and value of bacteriological diagnosis scheme	32	Privy system	9, 73—84
Isolation of infectious cases in	52	Puerperal fever	45
Refuse disposal in	79	Quarry Bank—	
Sewerage and sewage disposal in	85	Diphtheria and value of bacteriological diagnosis scheme	33
Lichfield—		Enteric fever in	42
Diphtheria and value of anti-toxin treatment	33	Measles in	28
Excrement & refuse disposal in	79	Phthisis, Bacteriological diagnosis of	47
Isolation of infectious cases in	53	Sewerage of	86
Zymotic death-rate in	26	Vaccination in	64
Lichfield (Rural)—		Water-supply of	90
Antitoxin treatment and bacteriological diagnosis of diphtheria cases	38	Whooping cough in	28
Infant mortality in	23	Reports, Special	9
Local Government Board Inquiries	5	Respiratory organs, Diseases of	46
Lodging-houses	101	Rivers pollution	3, 84—89
Longton—		Rowley Regis—	
Excrement & refuse disposal in	79	Dairies, Cowsheds, and milk-shops in	100
High infant mortality in	23	Diphtheria in	33
Measles...	26	Infant mortality in	23
Mortuaries	102	Influenza in	46
Newcastle—		Isolation of infectious cases in	54
Insanitary dwellings in	71	Measles in	28
Isolation of infectious cases in	53	Privy system in	79
Privy system in	79	Scarlet fever in	29
Slaughter-houses in	96	Sewerage of	86
Newcastle (Rural)—		Vaccination in	64
Water-supply in	94	Water-supply of	90
Overcrowding and insanitary dwellings	67—73	Rugeley—	
		Isolation of infectious cases in	54
		Water-supply of...	90
		Sanitary Committee—	
		General Work of	6
		Summary of the year's work of	3—8

	Page.		Page.
Scarlet fever	29	Stafford—	
Sedgley—		Diphtheria in	34
Damp houses and over crowding in	71	Higher death-rate in	18
High zymotic death-rate in ...	26	Housing of the working classes in	72
Isolation of infectious cases in	49, 55	Isolation of infectious cases in	56
Lower death-rate in	17	Measles in	29
Sewerage and sewage disposal in	87	Zymotic death-rate in	26
Water-supply of...	91		
Seisdon (Rural)—		Stoke-on-Trent—	
Excrement & refuse disposal in	83	Dairies, cowsheds, and milk-shops in	100
Isolation of infectious cases in	61	Diphtheria and antitoxin treatment	36
Water-supply in... ...	94	House drainage, Defects in ...	88
Sewage disposal, Experiments in...	5	Isolation of infectious cases in	56
Royal Commission on...	6	Phthisis, Prevention and cure of	47
Sewerage and Sewage disposal	84—89	Privy system in	81
Short Heath—		Slaughter-houses in	97
Death-rate as influenced by birth-rate	17	Slop-water closets & diphtheria	81
Isolation of infectious cases in	55	Vaccination in	65
Measles in	28		
Sewerage and sewage disposal in	88	Stoke-on-Trent (Rural)—	
Water-supply of... ...	92	Excrement & refuse disposal in	84
Slaughter-houses	96—98		
Smallpox	26	Stone—	
Smallthorne—		Isolation of infectious cases in	57
Diphtheria and value of anti-toxin treatment	33	Measles in	29
Infant mortality in	23	Sewage disposal experiments at	5
Smethwick—		Water-supply of...	92
Diphtheria and value of bacteriological diagnosis scheme	34	Zymotic death-rate in	26
Isolation of infectious cases in	49, 55		
Measles in	29	Stone (Rural)—	
Privy system in	80	Water-supply in...	94
Water-supply of... ...	92	Streams, Analyses of	3
Smoke nuisances	102	Table—	
		Showing birth-rates in Tipton, 1890-1900	13
		Showing comparative birth-rates, 1889-1900	11
		Showing comparative general zymotic mortality, 1889-1900	25
		Showing corrections to be made in death-rates of certain districts as the result of 1901 census	16
		Showing death-rates from measles, 1889-1900	27
		Showing death-rates from scarlet fever, 1889-1900	29

Page.		Page.	
Showing death-rates in Tunstall for five years	17	Tettenhall—	
Showing death-rates from whooping cough, 1889-1900 ...	40	Scarlet fever in	29
Showing death-rates in urban and rural districts, 1889-1900	14	Water-supply of... ..	92
Showing diarrhoea death-rates, 1889-1900	44	Tipton—	
Showing enteric fever death-rates, 1889-1900	40	Enteric fever in	43
Showing high death-rate districts	15	Isolation of infectious cases in	57
Showing high infant mortality towns	19	Low birth-rate in	12
Showing hospital as compared with house fatality among diphtheria patients in Stafford	35	Vaccination in	65
Showing population in urban and rural districts	11	Water-supply of... ..	92
Showing rates of infant mortality in groups of towns in Staffordshire, 1881-1900	24	Zymotic death-rate in	26
Showing scarlet fever deaths in Willenhall, 1873-1900 ...	30	Tunstall—	
Showing working of bacteriological examination scheme... ..	8	Diphtheria in	37
Tables, General	104-142	High birth-rate in	13
Showing infectious cases notified and isolated in hospital in 1900	115-129	High death-rate in	16
Showing summary of Sanitary Inspectors' work in 1900, 131—142		Isolation of infectious cases in	58
Showing vital statistics for 1900	104-113	Privy system in	83
Tamworth—		Tutbury (Rural)—	
Advantage of hospital isolation of diphtheria	36	Antitoxin treatment and bacteriological diagnosis of diphtheria cases	38
Housing of the working classes in	72	Sewerage & sewage disposal in	89
Isolation of infectious cases in		Water-supply in... ..	95
49, 57		Uttoxeter —	
Privy system in	83	Excrement & refuse disposal in	83
Sewerage and sewage disposal in	88	Uttoxeter (Rural)—	
Tamworth (Rural)—		Low infant mortality in	24
Sewerage and sewage disposal in	88	Water-supply in... ..	96
Walsall (Rural)—		Vaccination	61
Excrement & refuse disposal in		Walsall (Rural)—	
Infant mortality in		Excrement & refuse disposal in	84
Need of hospital isolation for scarlet fever cases in... ..		Infant mortality in	24
Overcrowding in		Need of hospital isolation for scarlet fever cases in... ..	30
Water-supply		Overcrowding in	73
Wednesbury—		Water-supply	89-96
Enteric fever in		Wednesbury—	
Influenza in		Enteric fever in	43
Isolation of infectious cases in		Influenza in	46
58		Isolation of infectious cases in	58
Measles in		Measles in	28
Vaccination in		Vaccination in	65

	Page.		Page.
Wednesfield—		Willenhall— <i>continued</i> .	
Isolation of infectious cases in	49	Vaccination in	66
Sewerage & sewage disposal in	88	Zymotic death-rate in	26
Vaccination in	66		
Water-supply of	92		
Whooping cough	40		
Willenhall—		Wolstanton (Rural)—	
Insanitary property in	73	Diphtheria and antitoxin treatment	39
Isolation of infectious diseases in	59	Excrement & refuse disposal in	84
Lower death-rate in	18	Isolation of infectious cases in	61
Scarlet fever in	30	Wolverhampton Water Scheme ...	8
Sewage disposal experiments at	5	Zymotic death-rate, General ...	25
Slop-water closets in	83	Zymotic death-rate, Special 26—45	
		Zymotic disease prevention 48—67	

STAFFORDSHIRE COUNTY COUNCIL.

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH,

Presented to the Council at the Quarterly Meeting,
November 12th, 1901.

IN this, my Twelfth Annual Report, I propose to adhere, so far as collating the Reports of District Medical Officers of Health is concerned, to the general plan adopted originally, and deal with the various reports under subject headings, in place of devoting a special summary to each, as is done in some county reports.

Were it not for the fact that the Administrative County contains so many sanitary districts, the latter plan would possibly be the better, but to adopt it, under the circumstances, and, at the same time, give sufficient prominence to the more important features of each report under review, would necessitate needless repetition, many remarks being equally applicable to several districts.

I have again indexed the Report, so that each question dealt with, whether of general or special significance, may at once be referred to.

As regards the general tables of statistics, although considerable changes have been introduced and additional information has been included in this year's returns forwarded by Medical Officers of Health to the Local Government Board, I have thought it advisable, notwithstanding the extra clerical work entailed, to tabulate the figures on the old lines for this year, as I felt it would be more appropriate that the new departure should date from the first year of the century and of another decennial period.

I take this opportunity of thanking the Medical Officers of Health, who, almost without exception, have fallen in with my suggestions as to the introduction into their reports of certain details which, from the point of view of the County Council, are of great value. There is still room, however, in some of the reports, for greater detail in the accounts given of the various outbreaks of infectious disease. It is also desirable that corrections should in all cases be made in the statistics of those districts where large public institutions, such as General Hospitals and Union Workhouses, affect the returns to an extent which materially interferes with accurate deductions being drawn from the figures. In many cases these corrections are made, but in a few they are not.

In the "Summary of the Year's Work of the Sanitary Committee of the County Council," I have endeavoured to convey some idea of what has been done in public health work, more with the view of indicating the lines on which the Committee are proceeding than with the hope that such a condensed account can convey an adequate idea either of the work itself or the good which has attended it.

SUMMARY OF THE YEAR'S WORK OF THE SANITARY COMMITTEE
OF THE COUNTY COUNCIL, WITH GENERAL COMMENTS ON
PUBLIC HEALTH ADMINISTRATION.

As regards the summary of the work of the Sanitary Committee, I would point out that this year embraces a period of 11 months only, from August 1st, 1900, to June 30th, 1901, as the last summary covered the ground up to the end of July of the previous year. The reason for this change is the practical difficulty I invariably experience in carrying the summary on to a date so near that on which this report is presented to the Sanitary Committee preparatory to its being presented to the Council. In future, then, the matters dealt with in this summary will cover a period of 12 months, ending June 30th.

The routine work under the Rivers Pollution Prevention Act has proceeded on former lines. The systematic work of inspecting existing sewage disposal works, and the collection of samples of sewage effluents and river water at fixed points on streams, has been conducted uninterruptedly, except during about two months of the year when such routine work was almost entirely suspended to allow of special enquiry being made into the circumstances attending the occurrence of numerous cases of arsenical poisoning in several districts throughout the County. In all, 299 analyses have been made, compared with 376 the previous year. The samples analysed comprised the following :—Sewage effluents, 212 ; river water, 39 ; and special samples (well waters mostly), 48. The falling off in the number of samples analysed is more apparent than real, and is accounted for partly because this summary relates to 11 months only, and also because of the arsenic enquiry above referred to. It is customary to call the Committee's attention, at the time, to any irregularities which were noted in the management of sewage works, and the responsible authorities in such cases are invariably communicated with.

To comment at all fully on the action which has been taken during the year in the matter of rivers pollution would

require more space than can well be devoted to one subject in a report of this description. Still, it may be useful to refer, shortly, to the more important questions in this department of the Committee's work which have received attention.

Satisfactory progress has been made during the year in the extensions and improvements at the Birmingham Tame and Rea District sewage disposal works, and in my next year's report I hope to be in a position to intimate that the extended area of land which is now being prepared for sewage treatment is in actual use. Additional tank accommodation is also being provided, which will undoubtedly improve the plant, and beds are being constructed for the treatment of a portion of the sewage on biological lines. While this work has been in progress it has not been considered necessary to hold a meeting of the Joint Committee of this Council and the Birmingham Corporation—the paramount authority of the Drainage Board—but should occasion arise this Committee will again meet, and considering the good which it has been instrumental in accomplishing hitherto, it is satisfactory to know that it still exists and can be called together at any moment.

With regard to the question of the disposal of acid waste from galvanizing works in South Staffordshire, little progress has been made, no definite understanding having yet been arrived at between the authorities and the manufacturers. In my last year's report I stated that representatives of the Sanitary Committee had conferred with representatives of the authorities interested, and had arrived at the conclusion that under no circumstances should acid waste or wash water be discharged into streams, but that the former, after treatment, and the latter, without treatment, but under reasonable restrictions, should be received into the sewers. During the year conferences have taken place between the Staffordshire representatives and a similar body from Worcestershire, in the hope that some definite line of action might be arrived at which would be acceptable to all parties. The difficulties, however, are great, and so far they are still unsolved.

As the Council are aware, from time to time, I have conducted experiments in sewage disposal methods for the information of Local Authorities, and I am pleased to be able to state that, as the outcome of such work, a scheme has been prepared for dealing with the whole of the sewage of Burslem, which I hope will soon be approved of by the Local Government Board. The experimental works at Stone and Willenhall have been in continuous operation, and valuable conclusions have been arrived at which are about to be submitted to the respective authorities, and upon which, I hope, improved schemes will be framed.

In connection with this work, I may mention that I have attended special meetings of the authorities, and have thus had opportunities of explaining technicalities which otherwise might have appeared somewhat obscure to persons unfamiliar with the subject.

In response to an application of the County Council for leave to take proceedings in the case of certain pollution from a chemical works in North Staffordshire, a Local Government Board Inquiry was held on November 7th, 1900, for the purpose of hearing evidence on both sides. I regret that the Local Government Board refused to sanction proceedings being taken, so that in the event of a similar occurrence in the future the County Council will be powerless in the matter.

In response to applications from local authorities, mostly for loans in connection with improved sewage disposal works, Local Government Board Inquiries have been held in the following urban districts :—Lichfield, Longton, Newcastle, Stoke-on-Trent, Tunstall, Uttoxeter, West Bromwich (C.B.), and Wolverhampton (C.B.). At all of these, with the exception of the Wolverhampton Inquiry, I was present and was able to support the applications of the authorities in question.

As regards other work under this heading, besides numerous communications with authorities, and consultations with their officers, 50 special reports have been presented to the Sanitary Committee during the year dealing with questions

relating to rivers pollution ; space, however, will not allow of more than an enumeration of the districts to which the reports in question had reference, as follows :—Audley, Biddulph, Bilston, Brierley Hill, Brownhills, Burslem, Burton (C.B.), Cannock, Coseley, Darlaston, Fenton, Hanley (C.B.), Heath Town, Kidsgrove, Leek, Lichfield, Longton, Newcastle, Quarry Bank, Rowley Regis, Rugeley, Sedgley, Short Heath, Smallthorne, Stafford, Stoke-on-Trent, Stone, Tamworth, Tettenhall, Tipton, Tunstall, Uttoxeter, Walsall (C.B.), Wednesbury, Wednesfield, West Bromwich (C.B.), Willenhall, and Wolverhampton (C.B.), all urban districts ; and Cannock, Gnosall, Kingswinford, Leek, Mayfield, Newcastle, Stone, Tainworth, Tutbury, Uttoxeter, Walsall, and Wolstanton rural districts.

In my last year's summary I intimated that, in company with the Chairman of the Sanitary Committee and a deputation from the Newcastle Corporation, I interviewed the Local Government Board in order to urge the Board to hold an Inquiry at Newcastle with reference to a proposed improvement scheme of sewage disposal, waiving for the moment the requirements of the Board as to land treatment. As the outcome of this interview I am pleased to say that the Board held an Inquiry on February 26th, 1901. The Chairman of the Sanitary Committee also attended this Inquiry, at which I strongly supported the scheme, and I am pleased to say that while this Report was in the printer's hands the formal assent of the Local Government Board to the scheme was received. In the interval between the holding of the Inquiry and the sanctioning of the scheme, the Report of the Royal Commission on Sewage Disposal was issued, and I cannot refrain from congratulating the Council on the conclusions regarding land treatment which the Commission have arrived at. I hope to be in a position in my next Annual Report to intimate the fact that the Local Government Board have adapted their future policy in accordance with the recommendations of the Commission.

As regards the general work of the Sanitary Committee, much has been done during the year. Eight special reports have

been presented dealing with important sanitary questions affecting Audley, Brownhills, Heath Town, and Tettenhall Urban Districts ; and Blore Heath, Cannock, and Wolstanton Rural Districts. The principal matters dealt with in these reports were defective water-supplies, insanitary property, and excrement and refuse disposal. In addition to these special reports, many matters have been reported upon which had arisen out of my Annual Report for 1899, and affecting 23 districts as follows :—Amblecote, Biddulph, Bilston, Brierley Hill, Brownhills, Burslem, Coseley, Darlaston, Handsworth, Newcastle, Quarry Bank, Sedgley, Short Heath, Smallthorne, Tettenhall, Tipton, Wednesfield, and Willenhall Urban Districts ; and Cannock, Gnosall, Kingswinford, Tutbury, and Uttoxeter Rural Districts.

In my next annual summary I hope to be able to refer to important initial steps being taken to secure the provision of efficient isolation hospital accommodation throughout the County under the scheme which the County Council adopted some years ago. Hitherto, defects in the Isolation Hospitals Act have obstructed all progress in this direction, and now that these defects have been removed by the Act of 1901, I am hopeful that satisfactory progress will be made. I may mention that the Longton Corporation have been in communication with me with reference to a hospital they intend to erect, and I have attended meetings of the Authority, at which the question was discussed. I understand that plans have now been prepared for the approval of the Local Government Board.

I also attended a meeting of the Rugeley District Council in order to place before them the arguments in favour of the formation of a joint area with Lichfield Urban and Rural Districts, as it had come to my knowledge that the District Council contemplated providing a small hospital for their own use. I am glad to say that the Authority ultimately determined to postpone the consideration of the question in the hope that the Isolation Hospitals Bill, then before Parliament, would become law. In all probability now that the Act has been passed the Council in question will fall in with the proposal to constitute a joint district.

The Council are to be congratulated upon the success which has attended the arrangement for the gratuitous bacteriological examinations in suspected cases of diphtheria, enteric fever and phthisis. In some districts, however, general practitioners have not availed themselves of this aid to accuracy of diagnosis to the extent to which one had hoped they would.

In the text of this report, the expressed opinions of many of the District Medical Officers of Health regarding the value of the scheme are quoted, and in the following table the actual number of specimens examined since the commencement are set forth. The very great increase in the number of examinations in the case of suspected diphtheria shows that the appreciation of the scheme is extending among the medical practitioners in the county; at the same time, it must be remembered that the disease was much more prevalent than in 1899.

BACTERIOLOGICAL EXAMINATIONS IN SUSPECTED CASES OF
DIPHTHERIA, TUBERCLE, AND ENTERIC FEVER.

	DIPHTHERIA.			TUBERCLE.			ENTERIC FEVER.		
	Positive.	Negative.	Doubtful.	Positive.	Negative.	Doubtful.	Positive.	Negative.	Doubtful.
Commencement of Scheme, Oct. 20, 1898, to June 30, 1899	110	101	1	212	...	...	...	...	...
From July 1, 1899, to June 30, 1900...	196	180	2	378	...	...	...	...	...
From Jan., 1900, to June 30, 1900. ...	...	...	...	...	9	14	...	23	5 4 ... 9
From July 1, 1900, to June 30, 1901...	350	350	30	730	30	70	...	100	36 36 2 74
Totals from commencement of Scheme to June 30, 1901	656	631	33	1320	39	84	...	123	41 40 2 83

It is satisfactory to be able to record that a scheme for extending the public water-supply of the County Borough of Wolverhampton, by operations which, in all probability, would have drained a considerable number of private well-supplies in the Seisdon Rural District, was defeated in Parliament.

The occurrence of a large number of cases of poisoning from arsenical beer led to a special inquiry into the circum-

stances, and the facts were set forth in a Report which I presented to the Sanitary Committee, and which was subsequently presented to the Council. The work entailed in this inquiry was considerable, and I take this opportunity of thanking the County Analyst and the Inspectors under the Food and Drugs Act for the invaluable assistance they afforded me. I must also thank the District Medical Officers of Health and the Medical Staffs of the various hospitals in the County for their kind co-operation in the work.

In addition to the work shortly detailed above, I have been consulted by Medical Officers of Health and other officers of local authorities on 69 occasions. On comparing this figure with those of previous years I find that there has been a steady increase in this important branch of my work.

Before closing this short summary I would specially refer to two most important features of this year's district reports, namely, the continued efforts which are being made by many of the urban authorities to abolish privies and private wells in favour of water-carriage systems and public water-supplies.

As regards the former question it is to be hoped that the account of this movement, which is recorded in this report, will stimulate those authorities, of urban districts more especially, who are not displaying much energy in this direction, to adopt this excellent policy. As regards the latter question, the remarks which follow under the heading of water-supply afford ample evidence of the risks attending the continuance of private well supplies, especially in populous districts, and point to the extreme importance of substituting for these, supplies from a public source when such are available, or, failing that, of making every effort to protect private wells from surface contamination.

Besides the Annual Reports of Medical Officers of Health, I have received 43 copies of special reports during the year, having reference chiefly to outbreaks of infectious disease.

I am pleased to say that all the Annual Reports of District Medical Officers of Health are now printed.

Summary of Reports with Comments.

AREA AND POPULATION.

No alteration has to be recorded in the area of the Administrative County, but, owing to an extension of the Tunstall Urban District, by the inclusion within that district of a portion of the Wolstanton Rural District, a slight re-adjustment is necessary in the areas and populations of these districts. The area which previously formed part of the Wolstanton Rural District, and which is now included in the Tunstall Urban District, amounts to 182 acres; and the population which has thus been transferred from the one district to the other is, approximately, 1,335.

The District Medical Officers of Health, in preparing their reports, had to base their statistics upon populations estimated on the 1891 census, and from the summary of the census returns which has recently been published, I find that in some cases these estimates differ considerably from those based upon the recent census figures. In the general tables attached to this Report I have shown the extent of error in each case, and it will be seen that, as regards the rates for urban districts, the error varies from an under-estimate, amounting to 10·1 per cent. in the case of Amblecote, to an over-estimate of 12·8 per cent. in the case of Brownhills. As regards the rural districts, the error varies from an over-estimate of 7·2 per cent. in the case of Cannock Rural District, to an under-estimate of 22·4 per cent. in the case of Stoke-on-Trent Rural District.

As regards the urban districts as a whole, the mean amended rate proves to be 1·7 per cent. higher than the recorded rate, and, strange to say, the mean recorded figure for the rural districts jointly was under-estimated to the same extent.

In the following table the actual census figures for 1891 and 1901 are set forth, the urban being distinguished from the rural districts :*—

	Census, 1891.	Census, 1901.	Increase.
Urban	599,476	695,786	96,310
Rural	214,670	231,106	16,436
Total.....	814,146	926,892	112,746

* As the actual figures in the case of the two divisions of the Tamworth Rural District could not be ascertained, an estimate was made based upon the relative population in each division according to the 1891 census.

BIRTHS.

The mean birth-rates of the whole Administrative County, and of the urban and rural districts respectively, for the twelve years 1889-1900, are shown in the following table, in which corresponding rates for England and Wales, and for the large towns in England, taken from the Registrar-General's Returns, are included :—

DISTRICTS.	BIRTH-RATE PER 1000 OF POPULATION.												
	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897*	1898†	1899†	1900†	
Staffordshire	Combined Urban & Rural	33.5	32.7	35.7	35.1	35.7	34.3	35.1	34.2	33.5	34.0	33.4	32.8
	Urban	35.2	34.5	37.3	36.3	36.6	35.4	36.2	35.4	34.8	35.0	34.5	33.9
	Rural	29.5	28.6	31.6	32.2	33.3	31.6	32.0	31.2	30.3	31.1	30.3	29.8
England and Wales.....													
Large Towns in England													

* Excluding Brownhills.

† The figures for Burton-on-Trent are taken into account for the three years 1898-1900 only.

The urban and rural birth-rates are shown in the statistical tables at the end of this Report, and little need be said about them here, beyond pointing out that in six instances in the case of urban districts—viz., Brownhills, Fenton, Heath

Town, Sedgley, Smallthorne, and Tunstall—the rates exceeded 40 per 1,000 of the population. It will be noticed that in all these cases the populations are made up of artisans.

In Bilston, where the rate was 36·4, the Medical Officer of Health points out that with one exception (1896) it is the lowest recorded in the decade.

In Burton-on-Trent, where a rate of 26·0 is commented upon as being the lowest hitherto recorded, the Medical Officer of Health writes:—"A diminishing birth-rate must necessarily be due to one of two causes—viz., either to a diminishing marriage rate or to a reduction of fecundity. The former cause is usually evidence of an absence of prosperity, and it is desirable to consider which of these causes is the true one.

"The following tables, showing the average number of marriages and births, together with the average rates, in successive quinquennial periods, make it quite clear that there has been no diminution, but rather a slight increase, in the marriage rate. On the other hand, the fecundity of marriage has dropped from 4·9 in the five years, 1880-84, to 3·2 in the five years, 1895-99, a decrease of 34 per cent. in the 15 years."

MARRIAGES AND BIRTHS IN SUCCESSIVE QUINQUENNIA.

Quinquennium.	Average No. of Marriages Annually.	Average No. of Births Annually.	Average Marriage rate per 1000 population.	Average Birth-rate per 1000 population.	RELATIVE FECUNDITY.	
					No. of Births per Marriage.	
1880-84	...	332	1653	8·3	41·7	4·9
1885-89	...	347	1614	8·0	37·5	4·6
1890-94	...	412	1557	8·8	34·5	3·8
1895-99	...	451	1481	8·9	29·2	3·2

The Medical Officer of Health of Tipton writes:—"I very much regret to have to call attention to our birth-rate, which is much lower than we ought to have expected, considering

that the district is made up of the artisan class. One thousand and eighty-one births were recorded against 1200 last year, and an average of 1138 for the previous ten years. This gives a rate per 1000 of 34.87 against 38.26 for the previous ten years.

	Number.	Rate.		Number.	Rate.
1890	1212	40.30	1896	1174	40.04
1891	1134	38.60	1897	1062	35.63
1892	1153	39.03	1898	1085	35.01
1893	1141	38.92	1899	1200	39.34
1894	1095	37.35	Average.	1138	38.26
1895	1127	38.44	1900	1081	34.87

"In a district such as ours the birth-rate is to some extent governed by the amount of work to be obtained; young agriculturists are tempted to come here by the hope of better wages and more regular work. Till the last two months work has been plentiful, more money has been earned in wages, and there has been general prosperity."

In Tunstall, on the other hand, where the rate was 42.9, it is referred to by the Medical Officer of Health as being the highest with one exception (1896) for the last ten years.

DEATHS.

The number of deaths registered in the Administrative County amounted to 17,509.

In the following table comparative figures for the past twelve years are given, together with corresponding figures for the country as a whole, and for town and country districts throughout England:—

DEATH-RATE PER 1000 OF POPULATION.

STAFFORDSHIRE.				ENGLAND.		
YEAR.	*General.	*Urban.	Rural.	General.	Large Towns.	Country Districts. †
1889 ...	18.0	18.9	15.4	17.9	19.2	16.5
1890 ...	19.8	20.0	16.3	19.5	21.6	17.5
1891 ...	19.9	20.7	18.1	20.2	22.4	18.5
1892 ...	18.8	19.2	17.9	19.0	20.6	18.1
1893 ...	18.6	19.5	16.3	19.2	21.5	17.4
1894 ...	16.2	16.5	15.4	16.6	18.0	15.6
1895 ...	18.5	19.1	16.9	18.7	20.5	17.0
1896 ...	17.2	18.0	15.2	17.1	19.2	15.3
1897 ...	17.8	18.6	15.7	17.4	19.1	15.8
1898 †...	17.7	18.4	15.5	17.6	18.3	16.0
1899 †...	17.2	17.8	15.4	18.3	20.2	16.3
1900 †...	18.7	19.3	16.8	18.3	19.5	16.9

* Excluding Brownhills in the case of the year 1897.

† Certain proportion of Urban residents included.

‡ The figures for Burton-on-Trent are taken into account for the three years 1898-1900 only.

On looking through the returns I find that the chief cause of the increased death-rate this year is an exceptionally large number of deaths from measles. To a lesser extent diphtheria also contributed to the higher rate.

The death-rates in urban and rural districts, together with the figures upon which they are based, are shewn in the tables at the end of the Report. In the following table the figures are given for those urban districts in which the rates may be said to be very high, together with figures and remarks bearing on the influences that causes, preventable and more or less non-preventable, have had on the results. The districts are placed in order, in accordance with the death-rates, the highest being placed first.

DISTRICT.	Death-rate per 1000 of Population.	Population estimated to middle of 1900.	Number of persons to the Acre.	Zymotic death-rate per 1000 of popula- tion.	Occupation, &c.	Increase over average of entire districts from the undermentioned diseases, affecting appreciably the general rate.				Position as regards mean death-rate for previous 10 years.
						Measles.	Whoop- ing Cough.	Diarrhea.	Diseases of Respi- ratory Organs.	
Tunstall ..	29.3	18,516	18.2	4.69	Working class.	..	..	..	Very consider- able.	22.9
Longton ..	26.2	37,210	18.6	5.75	..	Consider- able.	..	Consider- able.	..	24.2
Burslem ..	25.7	40,868	15.8	5.40	..	Slight.	..	..	Slight.	22.1
Darlaston ..	24.2	15,629	19.0	4.28	..	Slight.	..	Consider- able.	Slight.	22.7
Bilston	22.7	24,600	13.1	3.67	..	Slight.	..	Slight.	Consider- able.	22.3
Brownhills..	22.7	13,031	1.4	3.76	..	Slight.	Consider- able.	..	Consider- able.	16.5
Lichfield ...	21.6	7,864	2.3	2.28	Residen- tial.	..	Consider- able.	..	..	18.5
Smallthorne	21.5	6,275	11.8	2.54	Working class.	..	..	..	Very consider- able.	17.5
Coseley	21.3	22,000	5.5	2.77	..	Slight.	..	..	Slight.	19.1
Brierley Hill	20.8	12,250	12.0	3.02	..	..	Consider- able.	..	Very consider- able.	18.4
Fenton	20.5	23,000	14.3	3.39	..	..	..	..	..	21.5
Tipton	20.2	31,000	11.4	5.06	..	Consider- able.	..	Consider- able.	..	19.6
Wednesb'ry	20.2	26,000	12.2	4.53	..	Consider- able.	..	Consider- able.	..	18.7

It will be noticed from the last column that most of the districts included in this table may, taking local circumstances into account, be classed as high death-rate districts, and it behoves the Authorities, especially those of Tunstall, Longton, Burslem, Darlaston, Bilston, and Fenton, to consider the position very seriously in the hope of discovering any causes of a preventable nature which may be contributing to the high mortality in their districts.

In order to ascertain to what extent unavoidable error in estimating the populations may influence the death-rates as recorded in the above table I have worked out the figures on the more accurate data afforded by the new census figures with the following results :—

DISTRICT.		Death-rate as recorded.		Death-rate estimated on new census data.
Tunstall	...	29.3	...	28.1
Longton	...	26.2	...	27.3
Burslem	...	25.7	...	27.5
Darlaston	...	24.2	...	24.7
Bilston	...	22.7	...	23.1
Brownhills	...	22.7	...	19.8
Lichfield	...	21.6	...	21.5
Smallthorne	...	21.5	...	21.8
Coseley	...	21.3	...	21.1
Brierley Hill	...	20.8	...	21.2
Fenton	...	20.5	...	21.2
Tipton	...	20.2	...	20.6
Wednesbury	...	20.2	...	19.8

It will be noticed that in eight cases, viz., Longton, Burslem, Darlaston, Bilston, Smallthorne, Brierley Hill, Fenton, and Tipton, the rates when estimated on the more accurate data, are higher than the recorded rates, but the difference is unimportant, except in the cases of Longton and Burslem, the latter district then coming second in the list with a rate of 27.5 in place of 25.7. In the five cases in which the amended rates are lower, viz., Tunstall, Brownhills, Lichfield, Coseley, and Wednesbury, except in the case of Brownhills, where the rate is reduced from 22.7 to 19.8, the reductions are unimportant, and it will be seen that Tunstall still remains in the unenviable position of having the highest death-rate for the year.

The Medical Officer of Health of Tunstall, in commenting upon the lamentably high death-rate in that district, says :— “ I regret to state that this is the highest death-rate experienced during the last ten years, and compares very unfavourably with that recorded for the preceding year, shewing an increase of no less than 6.8 per 1,000.

“ The rates for the preceding five years were as follows : —

1899	...	...	...	22.5
1898	...	...	...	25.3
1897	...	...	...	20.95
1896	...	...	...	21
1895	...	...	...	26.1

" The factors in producing such a heavy mortality have been :—High infant mortality from diphtheria, diseases of the respiratory organs, constitutional and wasting diseases, constitutional diseases in adults, and diseases of the respiratory organs."

In Brownhills, the rate of 22.7 is said to be the highest recorded for many years, measles and consequent diseases of the respiratory organs being said to be largely responsible, it is but fair, however, to point out that the amended rate is considerably lower than the recorded one.

The Medical Officer of Health of Coseley attributes the high rate to influenza directly or indirectly.

The Medical Officer of Health of Brierley Hill says that measles and whooping cough and excessive fatality from pneumonia and bronchitis in children, chiefly accounts for the high death-rate in his district.

The Medical Officer of Health of Sedgley, where the recorded death-rate was 19.2, points out that with three exceptions, it is the lowest of the decade; it will also be seen from the general tables at the end of this Report that the amended rate estimated upon the 1901 census data, is lower still, viz., 18.3.

The Medical Officer of Health of Short Heath, where the recorded death-rate was 19.4, and the amended rate 20.5, writes as follows :—" Under the best sanitary conditions a large percentage of children born, die before they are a year old; a still larger percentage die where there are insanitary surroundings; and the more children there are in a neighbourhood, the greater the risk of contracting and spreading infectious diseases, and therefore the greater the number of deaths from infectious complaints between the ages of 2 and 10. Thus it

will be seen, given an unusually large number of young children in any locality, whether with an artisan or residential population, it must follow that even if the sanitary condition of the locality is excellent, there will be an addition to the death-rate from these causes as compared with places in which the number of children is unusually small. In practice, however, it will be found that the births are usually much more numerous in artisan populations than in residential towns ; a fact which I am sure is often either forgotten or not appreciated in estimating the relative salubrity of manufacturing and so-called residential towns."

I would point out with reference to the above quotation that a sudden increase in the birth-rate would tend, for a time, to raise the death-rate, but a continued high birth-rate, in the absence of emigration, would ultimately lead to a decline in the death-rate, owing to the resulting increase in the population of young adults, among whom the death-rate is low.

The Medical Officer of Health of Stafford, where the recorded death-rate was 17.5 and the amended rate 18.9, states that it is the highest rate since 1884, and attributes this to excessive mortality from measles, whooping cough, diphtheria, and diseases of the respiratory organs.

In Willenhall, where the recorded rate was 18.2 and the amended rate 19.4, the Medical Officer of Health points out that the rate has only twice been lower since 1857.

INFANT MORTALITY.

The infant mortality in the urban districts of the County is still maintained at a lamentably high figure. Although this year's figures show an improvement on those of 1899, still, they show no improvement on the mean for the past ten years, bad though the position was to start with, and in the face of considerable recent sanitary progress. This points to the conclusion that the remedy is largely a social as well as a sanitary one, although it by no means follows that the responsibility of Local Authorities as guardians of the public health is thereby lessened ; on the contrary, the

circumstance has the effect rather of widening the field over which search must be made for the remedies.

In the following table those districts are included which have an infant mortality rate this year of 200 and upwards, and it will be noticed that in no less than six instances this enormous rate has been reached :—

Deaths in children under one year per 1000 registered births.								
	Bilston.	Burslem.	Darlaston.	Longton.	Newcastle.	Tunstall.	Urban Districts in County.	Large Towns in England.
5 years 1889-93...	203	193	214	225	167	213	173	168
,, 1894-98...	207	204	212	247	184	224	176	171
1899...	189	197	243	245	185	181	179	181
1900...	221	230	221	255	204	241	176	172

It must not be supposed, because prominence is given in the above table to these towns which have exceptionally high infant death-rates, that, therefore, other towns have favourable records ; this is far from being the case, as a glance at the seventh column of the death-rate table at the end of this Report will show.

Under this heading the Medical Officer of Health of Bilston writes :—“ The persistent high death rate in infants is one of the most lamentable features in the mortality statistics of the district. Ignorance of the proper methods of feeding and nursing, over-crowding and insanitary surroundings, are all potent factors in its causation, and the remedies therefore, are the provision of healthier homes, more open spaces round, and the prevention of accumulations of decomposed and decomposing matters near dwellings, the proper pavement and drainage of courts and yards, and the instruction of parents in the right way of taking care of their infants.

“ As to the latter various plans have been suggested. Free health lectures to mothers are given in some districts by the County Council Lecturer. The chief objection to this is that

experience shews that those who most need instruction are those who will not take the trouble to attend. It would be of much greater benefit if some scheme could be devised for sending gentlewomen, properly qualified for the task, to visit the homes of the poor, and those who are indifferent, who would instruct them in a proper way to bring up their children. Further, in the Handsworth District a printed leaflet, prepared by the Medical Officer of Health, is presented to every person registering the birth of a child, setting forth, in simple language, instructions regarding the care and feeding of infants. It seems to me that it would be advisable to provide the Registrar in this district with similar papers, and ask him to distribute them in the same way."

It is to be hoped that the Bilston District Council will act upon the advice contained in the last sentence of the above quotation.

The Medical Officer of Health of Brierley Hill—where an infant death-rate of 159 was the lowest recorded since 1886, the mean for the previous ten years being 173—writes as follows:—"I do not think sick children amongst the poor and many of the working classes are intelligently nursed, and I think it is well worth consideration whether something cannot be done to secure the services of a trained resident nurse in the district. We have difficulty in getting a trained nurse for the hospital, at least at short notice, but if we had one always in the district, I should think her services could be arranged for at the hospital when required.

"Most parishes have now what is called the 'parish nurse,' who goes about assisting the sick poor. If it is not expedient to obtain one in any other way, could not the Council do something to encourage the appointment of a 'parish nurse' for Brierley Hill? It is the very poor that need assistance most, and young mothers, who are ever ready to accept any 'grandmotherly' advice that may be offered to them. To have an intelligent trained nurse to appeal to would be a great help.

“ We might obtain the assistance of a health ‘missioner’ through the County Council—a very excellent system, I have no doubt, whilst the missioner is at the work, and a good introduction for a resident trained nurse to begin upon; but personally I would prefer to have a good district nurse, who could get known to, and win the confidence of, the people whom she went to assist.

“ At Stockport, for some time past, a scheme has been working for imparting instruction in home hygiene and nursing, and the care of infants, especially with regard to feeding, to the senior girls in the public elementary schools, and also a rather more advanced class in the evening continuation schools. The Sanitary Committee supports this scheme, pays some of the cost for apparatus, or supplies it altogether, and gives prizes for competition of 7s. 6d. each.

“ This is the sort of effort that should bear good fruit in the future, and be useful to the rising generation of mothers, and therefore, I think, it is one which you might take into consideration. The first step, of course, would be to ascertain whether the School Board would favour the proposal. I imagine the details could easily be arranged afterwards.”

The Medical Officer of Health of Coseley again recommends his Council to make provision for a course of health lectures.

The Medical Officer of Health of Darlaston writes:—
“ Although I have to record a slight diminution in the number of deaths among infants compared with last year, yet the total is far too large and I must again refer to injudicious feeding and insanitary conditions as chiefly concerned in its production.

“ It will be noticed that the four conditions claiming the highest number of deaths within the first year of life are diarrhoea, congenital debility, premature birth and bronchitis, all of which are more or less intimately connected with the foregoing factors.

“ With regard to diarrhoea for instance, faulty feeding has long been recognised as its chief exciting cause, while the

insanitary condition of houses and their surroundings favour the growth of the special diarrhoeal germ.

“ Although congenital debility and premature birth are vague as causes of death, it is easy to see how these two conditions react on a child rendered the more puny by reason of unhealthy surroundings and careless feeding.

“ Bronchitis is especially liable to associate itself in the very young with any enfeebled condition of the body.

“ With the object of trying to lessen the evil I drew up a circular on ‘ Advice to mothers on the feeding and management of Children,’ some of which were given to the Registrar of Births for distribution.

“ I venture to think that the advent of our District Nurses under the new scheme, will be most valuable in helping to disseminate among the poor, that knowledge, the possession of which would do at least something to stem the tide of infantile mortality.”

The Medical Officer of Health of Fenton writes :—“ The infant death-rate remains too high, and I feel more certain than ever that improper feeding and ignorance generally are its chief causes ; a time could well be allotted in the school curriculum during which a knowledge of elementary physiology and hygiene could be acquired ; this knowledge would in the next generation have the effect of diminishing the infant death-rate and that of the population generally.”

The following significant remarks appear in the Report of the Medical Officer of Health of Handsworth :—“ Of the 179 infants, 40 having died shortly after birth, may be excluded from an inquiry as to the mode of feeding. Of the remaining 139, the diet could not be ascertained in eight cases, 34 were fed at the breast, 80 were brought up by bottle, and 17 were both breast-fed and hand-fed. As was the case in 1899, three-fourths of the children who died had been brought up by bottle entirely. Of the 46 children who died of diarrhoeal diseases and gastro-enteritis, 36 were hand-fed, two breast-fed, and six

had been brought up on breast and bottle, and in two cases the parents had gone away before enquiries were made.

“ On the important subject of the care and feeding of infants, a leaflet drawn up in simple language is given to every person who registers the birth of a child. Copies of this leaflet may be obtained at the office of the Sanitary Inspector at the Council House.”

In Longton, where the almost phenomenal mortality of 255 infants per 1,000 births took place, the Medical Officer of Health attributes the fatality partly to improper feeding, the result of ignorance, and partly to the foul surroundings of houses, resulting from privies and ashpits. This opinion, in the face of the gravity of the situation—for the mean infant mortality in Longton is higher than any town, not only in the County, but in England—should lead to a determined effort on the part of the Corporation to abolish privy-middens in the town, and allow nothing to stand in the way of improving generally the surroundings of the houses in accordance with the repeated and urgent advice of their Medical Officer of Health.

The Medical Officer of Health of Rowley Regis states that the District Council have decided to issue a circular regarding the proper feeding of infants, and it is their intention to request the local Registrar of Births to hand one to each person who registers a birth.

The Medical Officer of Health of Smallthorne, where the infant death-rate amounted to 178, states that “ this high infant mortality is certain to continue until a knowledge of the proper nursing and feeding of infants becomes more general amongst mothers.”

The Medical Officer of Health of Eccleshall Rural District attributes a large number of deaths among infants to improper feeding.

In Lichfield Rural District whooping cough and measles are said to have contributed largely to the infant death-rate.

The Medical Officer of Health of Uttoxeter Rural District refers with satisfaction to an infant death-rate of 67 per 1,000 births compared with a mean of 124 for the previous three years.

The Medical Officer of Health of Walsall Rural District in calling attention to an infant death-rate of 182, says :—" I regret that the suggestion I made in my last annual report of giving to each person who registers the birth of a child, a leaflet, stating simple instructions regarding the care and feeding of infants has not been acted upon. The cost would be trifling, and would in time, I am convinced, be attended by beneficial results. I will bring this matter under the attention of the Council at an early meeting."

The Council will remember that I conducted an inquiry nine years ago into the effect of factory labour on the infant mortality. I give in the following table the original figures for the artisan towns, classified in accordance with the relative proportion of married women engaged in factory work, together with corresponding figures for the past ten years :—

Deaths in Children Under One Year per Thousand Births in Three Classes of Artisan Towns in Staffordshire.

	CLASS I. Many women engaged in work.	CLASS II. Fewer women engaged in work.	CLASS III. Practically no women engaged in work
10 years, 1881-90	195	166	152
10 years, 1891-1900	211	177	167

These figures speak for themselves. It will be noticed that while there has been a general increase in the infant death-rate, practically very much the same relative proportion has been maintained between the three classes of towns.

This increase, coincident with an undoubted improvement in the sanitary condition of towns, is, perhaps, the most unsatisfactory feature in the mortality statistics of the County. The infant mortality is considered one of the best tests of

sanitary conditions ; this being the case, and in view of the sanitary progress which has taken place, one must look to other causes to explain the growing infant death-rate, and among these causes in this County a prominent place, I fear, must be given to the prevailing practice of mothers leaving their homes to work in factories.

ZYMOTIC DEATH-RATE.

The death-rate from zymotic diseases, including under this heading, according to the Registrar-General's classification, the seven principal ones—viz., small-pox, measles, scarlatina, diphtheria, fevers, whooping cough, and diarrhoea—is higher this year than last, in fact, with one exception (1898), it is the highest rate I have yet had to record.

In the following table the comparative figures are given for the past twelve years, together with similar figures for England and Wales, and for the larger towns in England :—

	Zymotic Mortality per 1000 of Population.			England and Wales.	Large towns in England.
	Urban.	Rural.	Urban & Rural combined.		
1889	2.36	1.17	1.99	2.40	2.72
1890	2.06	1.15	1.77	2.05	2.77
1891	2.00	1.36	1.82	1.83	2.41
1892	2.03	1.10	1.77	1.90	2.63
1893	2.41	1.58	2.17	2.47	3.17
1894	1.68	0.97	1.47	1.76	2.43
1895	2.39	1.15	2.04	2.14	2.82
1896	2.71	1.55	2.39	2.18	2.90
1897	2.91	1.57	2.54	2.15	2.87
1898	3.41	1.68	2.97	2.22	2.85
1899	2.54	1.27	2.22	2.21	2.81
1900	3.04	1.89	2.75	2.00	2.50

It will be noticed that both urban and rural districts have contributed to the increased rate; and on comparing the figures of the individual zymotic death-rates for this year with those for last year, it will appear that measles and diphtheria, but chiefly the former, are responsible for the less favourable rate.

The Medical Officer of Health of Lichfield, where a zymotic death-rate of 2.28 is said to be the highest yet recorded, states that whooping cough was the chief cause of the increase.

The Medical Officer of Health of Sedgley, in discussing a zymotic death-rate in that district of 4.35, says:—"Although the zymotic death-rate, taken as a whole, is high, it is explained by the increased mortality from measles, while diphtheria, diarrhoea, and typhoid fever have all lessened very considerably on the previous year, and, as a whole, on the previous four years. It is a legitimate inference to draw from these facts and figures that the sanitary condition of your district has improved during the year, for a high death-rate from enteric (*i.e.*, typhoid) fever, diphtheria, or diarrhoea may in general fairly be taken to imply a defective sanitary state."

In Stafford a zymotic death-rate of 2.44 is referred to as being the highest since 1878, the mean of the previous ten years being 1.02; and the cause is attributed to measles, diphtheria, and whooping cough.

In Stone, Tipton, and Willenhall, measles is also mentioned as being the chief cause of increased zymotic death-rates.

SPECIAL ZYMOTIC DEATH-RATE.

Smallpox.—No deaths have occurred from this disease during the year.

Measles.—In the Administrative County, 782 deaths occurred from measles, as compared with 62 in 1899, equal to a rate per 1,000 of the population of 0.83, as against 0.06. Of these deaths, 668 occurred in the urban districts, or 0.95 per 1,000, and 114 in the rural districts, producing a rate of

0·48 per 1,000. In the following table corresponding figures are given for the past twelve years:—

MEASLES.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	
Urban	Number of Deaths...	347	221	368	187	283	183	280	525	192*	599	58	668
	Rate per 1000.....	0·64	0·40	0·67	0·33	0·50	0·32	0·48	0·88	0·32*	0·90	0·08	0·95
Rural	Number of Deaths...	66	37	106	20	111	39	25	106	62	115	4	114
	Rate per 1000.....	0·26	0·14	0·44	0·08	0·48	0·17	0·11	0·47	0·27	0·50	0·01	0·48

* Excluding Brownhills.

The great prevalence of this disease is noted in most of the reports.

Under this heading the Medical Officer of Health of Bilston writes:—"There were a few cases of measles in the town in February and a few more in March. In April the epidemic extended considerably, and reached its height in June. Unlike most previous outbreaks, however, the complaint was not identified specially with any one or more schools, but seemed fairly general. Cases continued to appear, though in less numbers, in each month until October, when again there was a considerable increase, while at the end of the year only a few cases were known. Thirty-five deaths, all, with one exception, in children under five years of age, were recorded—viz., one in February, one in March, one in April, three in May, thirteen in June, one in July, three in August, two in September, nine in October, and one in November.

"Unfortunately, this disease is looked upon by the public as of little moment, and as one that a child must have sooner or later, whereas it is, at least when neglected, most serious, in consequence of the rapidity and ease with which it spreads, and the dangerous complications which so readily and so frequently supervene. This is seen by this year's mortality, though in the year 1895 even more deaths—viz., 51—were due to it. Measles is not a notifiable disease, nor would notification be of any real use unless each case could be thoroughly and promptly isolated. It is possible, however, that notification of the *first* case in every affected household would be of

value by giving us immediate information of the earliest cases, and so enabling us to adopt prompt measures to isolate the affected children as far as possible, and still more to prevent other children from affected houses from continuing attendance at school for a definitely safe period."

With reference to measles and whooping cough, the Medical Officer of Health of Quarry Bank says :—" My experience with both these diseases, so far as concerns your district, is, that domestic precautions are practically futile as a preventive means, and in fact that school closure is not only an effective remedy, but the only one of any value."

In Rowley Regis, an extensive epidemic occurred which resulted in 47 deaths, and the Medical Officer of Health states, that the type of the disease was severe. Certain schools in localities where the disease mostly prevailed were closed, and in other cases children belonging to infected families were prevented from attending school.

The Medical Officer of Health of Short Heath, where 158 cases were known to have occurred, 12 of which proved fatal, writes as follows :—" Although there is no doubt the disease was severe in type, I cannot help thinking there would have been less suffering and possibly less fatality due to it, if people would not regard the disease as trivial in its nature and would take more care to keep the sufferers thoroughly warm, especially during the first few days of the ailment, when there is a special liability to lung complications."

Under this heading the Medical Officer of Health of Wednesbury writes :—" Reference must be made to the very fatal nature of the measles epidemic which occasioned no fewer than 59 deaths. It is difficult to say anything upon this subject, although the disease was responsible for no less than 11.2 per cent. of the deaths from all causes. Public opinion is, so far, opposed to the idea of isolating measles or to regarding the disease seriously ; and I am convinced that the town will regard this very heavy death-list with perfect equanimity. So long as this is the case, and so long as the public continue to view measles

as a trifling ailment, not even calling for medical advice until some serious complication is superadded to the main attack, so long shall we continue to record a long list of fatal cases whenever the disease becomes epidemic."

Among other reports, in which special attention is called to the unusual prevalence of the disease, may be mentioned those of the Medical Officers of Health of the urban districts of Brownhills, Smethwick, Stafford and Stone, and the Kingswinford rural district.

Scarlet Fever.—In the Administrative County, 182 deaths occurred from scarlet fever, as compared with 190 in 1899, equal to a rate per 1,000 of the population of 0·19, as against 0·20. Of these deaths, 130 occurred in the urban districts, or 0·18 per 1,000, and 52 in the rural districts, producing a rate of 0·22 per 1,000. In the following table, corresponding figures are given for the past twelve years:—

SCARLET FEVER.		1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Urban	Number of Deaths...	108	145	144	105	119	101	142	143	150*	132	148	130
	Rate per 1000.....	0·20	0·26	0·25	0·18	0·21	0·17	0·24	0·24	0·25*	0·19	0·21	0·18
Rural	Number of Deaths...	30	51	63	29	27	29	43	43	30	42	42	52
	Rate per 1000.....	0·12	0·19	0·26	0·12	0·11	0·12	0·19	0·19	0·13	0·18	0·18	0·22

* Excluding Brownhills.

A mild form of this disease seems to have been prevalent in most of the districts in the county, and special mention is made in several of the reports of the fact that the ailment has become less virulent in recent years.

The Medical Officer of Health of Rowley Regis states that the district has not been free from the disease for ten years, but that this year both the number of cases and the deaths have been fewer and the type milder than in the two preceding years.

The Medical Officer of Health of Tettenhall is of opinion that the disease is neither so virulent to the individual nor so infectious to the community as it was twenty years ago.

The Medical Officer of Health of Willenhall states that the disease was more prevalent than in any year since 1881, and says :—"The cases were on the whole mild and in marked contrast to my experience of the disease in years past. The sufferers are now better managed and better looked after than they used to be, with the result that there are fewer renal and glandular complications, and therefore much fewer deaths.

"How great the difference is may be best understood by the following record of deaths in Willenhall from scarlet fever:—

From 1873 to 1877 inclusive	...	151 deaths
,, 1878 „ 1882	„	157 „
„ 1883 „ 1887	„	12 „
„ 1888 „ 1892	„	29 „
„ 1893 „ 1897	„	6 „
„ 1898 „ 1900	„	7 „

and this in spite of considerable increase in population, and of the fact that very few of the cases were treated in hospital."

The following account, in the report of the Medical Officer of Health of Kingswinford Rural District, of legal proceedings which were taken in order to safeguard the public is interesting :—"In one case in which the parents of the child kept a little meat and bread shop, there was great danger of the disease being spread. As the parents would neither close the shop nor consent to have the child removed to hospital, it became necessary to obtain a Magistrate's order, with the result that the shop was closed. This case, by showing the people that the Council have not only the power but the will to compel them to have proper isolation, will, I hope, facilitate matters in the future."

With reference to the need of means of isolating such cases, the Medical Officer of Health of Walsall Rural District writes :—"That the number should be increased is not surprising, as throughout the year a large number of cases have kept occurring in the neighbouring Borough of Walsall, with which place so much intercommunication exists, and where, as in the case of our rural district, no steps are taken by the

Corporation for hospital isolation of these cases. As the infection of scarlet fever lasts so long I believe that in a district where the large proportion of the population live in cottages it is impossible to adequately stamp out this disease (which undoubtedly is a preventable one) unless hospital isolation is provided and enforced."

Diphtheria and Membranous Croup.—

In the Administrative County, 485 deaths occurred from diphtheria and membranous croup, as compared with 260 in 1899, equal to a rate per 1,000 of the population of 0·51, as against 0·28. Of these deaths 371 occurred in the urban districts, or 0·52 per 1,000, and 114 in the rural districts, producing a rate of 0·48 per 1,000. In the following table corresponding figures are given for the past twelve years:—

DIPHTHERIA.		1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900†
Urban	Number of Deaths...	27	23	37	32	24	47	65	131	190*	230	155	371
	Rate per 1000.....	0·05	0·04	0·06	0·05	0·04	0·08	0·11	0·22	0·32*	0·34	0·22	0·52
Rural	Number of Deaths...	28	14	25	21	18	34	28	30	59	47	42	114
	Rate per 1000.....	0·11	0·05	0·10	0·09	0·08	0·15	0·12	0·13	0·25	0·20	0·18	0·48

* Excluding Brownhills.

† Including Membranous Croup.

The Medical Officer of Health of Bilston again, as in his report for the previous year, calls attention to the fact that none of the local medical practitioners have as yet availed themselves of the County Council scheme for obtaining bacteriological examinations in cases of supposed diphtheria, enteric fever, and phthisis.

The Medical Officer of Health of Coseley has a somewhat similar experience to record.

With reference to the use of anti-diphtheric serum as a preventive, the Medical Officer of Health of Burton-on-Trent (now a County Borough) writes:—"It has been found that a comparatively minute dose of antitoxin administered to a healthy person will confer protection against diphtheria for a short time. It is therefore being increasingly used as a

means of protecting the other members of infected households, and so preventing it from spreading. At the suggestion of the Medical Officer of Health, several of the medical men in the borough have been employing this method in cases where the parents were willing to avail themselves of it. At first a little persuasion was necessary, as the method was a new one, and in order to encourage it, a circular letter was issued by the Medical Officer of Health to the heads of infected households. Already, now that this method is becoming known, objection is fast disappearing.

“ During the six months, July-December, 1900, I have records of 124 persons, mostly children, living in houses attacked by the disease who were protected in this way. The actual number is probably somewhat greater than this, for when the injection is not performed at once they sometimes escape record. Yet only three persons of those protected were subsequently attacked by the disease. In two of these cases it was found, however, on inquiry, that symptoms of the disease had already begun to appear at the time the injection was performed. These two cases (they both had mild attacks) must therefore be excluded. In the third case the person was not attacked till three months later, and it is not claimed that the protection will last more than two or three weeks. The result, therefore, so far, has been quite satisfactory. It is not to be supposed that the protection conferred by antitoxin is absolute. Statistics which have been collected in New York on a very much larger scale show that in a very few cases the disease may be contracted, but almost always in only a mild form.”

In Fenton only 13 out of 103 cases which occurred were isolated, notwithstanding the expressed opinion of the Medical Officer of Health that personal infection was “ the chief medium of diffusion.” In the same report it is stated that serum treatment had been tried in many cases with satisfactory results.

With reference to the County Council scheme of bacteriological examinations, the Medical Officer of Health of Leek

Urban District writes as follows :—“ During this epidemic we were considerably helped in confirmation of diagnosis by the County Council arrangements for the examination of throat swabs at the Mason College, Birmingham ; for these facilities, and the promptitude with which the reports on cases sent were made, we express out gratitude and best thanks to the County Council.”

The following paragraph from the report of the Medical Officer of Health of the City of Lichfield is well worthy the attention of the Corporation and other sanitary authorities :—“ You district has been comparatively free from this disease since I have known it, but as several cases have recently occurred among the poorer class of people where the doctor might find the cost of antitoxin a material consideration, I would strongly advise that the outfit cases for sending secretion, already arranged for with Mason College, Birmingham, by the Staffordshire County Council, should be supplemented in every case by a free supply of antitoxin for all individuals where its use is demanded and who cannot afford to purchase it. Its early use in the treatment or prevention of the disease has now been proved to be of invaluable service.”

The Medical Officer of Health of Quarry Bank writes :—“ I have found the bacteriological test at Birmingham University, as arranged by your Council and the County Council, of great use in deciding doubtful cases.”

The Medical Officer of Health of Rowley Regis points out that most of the 33 cases which occurred in that district were associated with old and offensive privies, damp cellars, and the disturbance of the surface soil in connection with the work of connecting the houses with the new sewers. He also expresses regret that the scheme for obtaining bacteriological examinations in doubtful cases of diphtheria, enteric fever, and tuberculosis, is not taken advantage of to the extent it might be.

The Medical Officer of Health of Smallthorne states that anti-diphtheric serum was used with good results in the majority of the 21 cases which occurred in that district.

The Medical Officer of Health of Smethwick writes :—
 “ An element of precision has been imported into the consideration of this disease by the facilities which are now afforded by the bacteriological examinations which, at the instance of the Staffordshire County Council, were adopted in 1899 by this Sanitary Authority. Generally speaking, medical practitioners have availed themselves of them. They have afforded a great aid to accurate diagnosis, and many cases that otherwise would probably have been considered doubtful have been discovered.”

With further reference to the value of the bacteriological test and the use that is made of it the same Medical Officer of Health writes as follows :—“ In 1899, only in a few instances were these bacteriological examinations solicited ; this year it is gratifying to observe that this invaluable test has been freely utilised. Of course, in many instances a doctor is satisfied by clinical evidence of the true nature of the disease, and in such cases very properly deems a bacteriological examination unnecessary, but these examinations it must be remembered are not only useful as a means of confirming the diagnosis arrived at by such clinical observation, but also as insuring on the apparent convalescence of the patient, proof of freedom from infectiveness. The Health Committee have wisely advised that bacteriological proof of such freedom from the disease should be obtained before a patient, who has been notified to be suffering from the disease, is officially certified to be free from it and at liberty to resume his ordinary avocation. Acting in accordance with this determination, the disinfection of infected houses is not performed until such proof is forthcoming, and as regards school children this regulation is carried out with especial strictness, and no scholar who has suffered from diphtheria, or in whose house diphtheria has occurred, is allowed to resume attendance at school until a certificate has been forwarded by the Medical Officer of Health to the School Board.”

In the report of the Medical Officer of Health of Stafford, where a serious outbreak of diphtheria occurred, the following interesting statement appears :—“ In the early cases free use

was made of the County Council's arrangements with Mason University College for bacteriological examination. The facilities thus afforded to medical officers of health, and, through them, to the local medical practitioners has been of great value. Accommodation is not provided in the Isolation Hospital for diphtheria, and the 10 cases up to September were all treated at their homes. In the second week of October, however, things looked so serious, that I considered it of the first importance to isolate the cases, and, with that object, I opened the wooden annex, and extra nurses were engaged. Ten beds were thus provided, and all the patients fit to be moved were at once transferred there. The accommodation proved to be adequate, and every subsequent case requiring it was isolated. Altogether 50 cases were dealt with in the Isolation Hospital, five cases in the Workhouse Hospital, while 46 were treated at their homes.

Where Treated.	No. of Cases.	Deaths.	Proportion of Deaths to Cases.
At Home	46	12	26·08 %
Isolation Hospital... ...	50	6	12 %
Workhouse Hospital	5	0	0 %
Total	101	18	17·8 %

" All the hospital cases were treated with antitoxin. So far as I know only 18 of the home cases were so treated, although it is supplied free. Many of the cases were far advanced before medical advice was sought, and there can be no doubt that a fatal issue might have been avoided in many cases if treatment had been begun earlier. I wish I could speak with some degree of certainty of the cause of this epidemic. All the houses affected have been visited by me, some of them several times, and the chief sanitary defects I noted were that in a large proportion of instances the houses were damp. This dampness came not so much from defective spouting as from the ground. Houses with unpaved yards and fronts were certainly more affected than others. And often these unpaved yards were fouled by decaying vegetable matter, and by

animals and fowls kept on the premises. In many cases the slop-closets had been repeatedly blocked, and in these and other instances the drains were found to be defective. Some of the houses were found to be filthy, others were just as clean. The weather during this period was persistently mild and damp, with little or no wind—just the conditions favourable to the development of germ life. Whatever other causes may have been at work, I cannot but think that the conditions of the air, both in the ground and above it, have been potent factors in generating the diphtheria bacillus. The milk supply might, of course, very readily and very quickly cause an epidemic. I enquired carefully into this matter, and was struck with the variety of the supply. Rarely did two houses even in the same street have the same milk. So this had evidently nothing to do with it. Nor can the schools be said to have started it. The first cases were not attending school, and several original cases were in children under school age. Besides, no school was particularly affected until towards the end of the year. The schools, however, must have helped to spread the disease once it had started. An analysis of the ages of those affected goes to support this, for of the 101 cases notified 24 were under five years of age, 70 were over five and under 15, and seven over fifteen. Therefore, of children under fifteen, those of school age were affected in the proportion of three to one of those under school age. Contrary to what one would expect the mortality rate was higher among the older children. One-fifth of these died compared with a sixth of the younger group."

With reference to the use of antitoxin serum, the Medical Officer of Health of Stoke-on-Trent, where 129 cases of diphtheria occurred, says:—"On the recommendation of the Medical Officer of Health, the Sanitary Committee decided to supply antitoxin free of charge for prophylactic use to any medical man in the borough. It has only been made use of in four or five instances. Antitoxin might with advantage be more frequently used as a prophylactic."

It is satisfactory to find that all the cases which occurred in Tamworth were isolated in hospital, and that no second cases occurred in any of the infected houses.

In Tunstall, where 153 cases occurred and nine cases of membranous croup, causing no fewer than 42 deaths, a special report, which the Medical Officer of Health prepared for the Local Government Board, is re-produced in his annual report. It is unsatisfactory to find that, owing to inadequate hospital accommodation, it was found possible to isolate only seven cases; and still more unsatisfactory is the following paragraph relating to houses erected quite recently in a new street:—“Here I found very serious sanitary defects. In many of the yards there were no arrangements whatever for the deposit of ashes and house refuse. Many of the water-closets were faulty in their connections with the sewer, and the closets themselves, Duckett in type, badly constructed, and in my opinion more dangerous than an ordinary cesspit.”

It is difficult to conceive how it is possible that such a description can apply to new property, and if the Authority have not already taken steps to sift the matter to the bottom, it is most desirable that they should do so.

The Medical Officer of Health of Blore Heath Rural District writes, with reference to the bacteriological examination of specimens:—“Full advantage of this arrangement has been taken by medical practitioners in your district.”

The Medical Officer of Health of Cannock Rural District writes under this heading, with reference to legal proceedings which were taken in one case, as follows:—“I laid down very strict injunctions in the presence of the Inspector as to the necessity of isolation from the general public, and as to the methods by which such a dreaded disease may become disseminated. My advice was utterly neglected, and I presented to the Council a detailed statement of the carelessness exhibited and the importance of having the advice of their officers strictly carried out. The Council unhesitatingly instituted legal proceedings for the unlawful exposure of an infected person, and secured a conviction, thereby giving a salutary lesson to the public on the importance of the carrying out of sanitary regulations.”

The Medical Officer of Health of Cheadle Rural District says :—“ The medical men still take advantage of the opportunities offered by the County Council for the bacteriological examination of throat specimens.”

With reference to bacteriological examinations and the use of antitoxin serum, the Medical Officer of Health of the Eccleshall division of the Stone Rural District writes as follows :—“ I should be glad to see that medical practitioners in the district always availed themselves of the means provided for a bacterial examination. I should also like to see your Council supply diphtheria antitoxin free of charge to medical men within the district, on application to the Medical Officers of Health, as is the case with some District Councils. The use of this form of treatment is now proved to have greatly reduced the mortality of this very fatal disease.”

The Medical Officer of Health of Lichfield Rural District writes :—“ The facilities for bacteriological examination of throat secretions, arranged for with Mason College, Birmingham, by the Staffordshire County Council, have been until recently but sparingly taken advantage of. This has no doubt been owing in a great measure to the comparative freedom which the district has enjoyed from the disease for many years. The patients who have suffered have also been very poor, and in many cases the expense of the antitoxin would prove to be a material consideration to the medical attendant. I am therefore of opinion that the provision of the necessary outfit cases for sending secretion should be supplemented, in the event of an epidemic, by a free supply of antitoxin for all individuals where its use is demanded and who cannot afford to purchase it. To be successful its early use is of vital importance.”

The Medical Officer of Health of Tutbury Rural District under this heading writes :—“ Sore throats seem to have been prevalent to a considerable extent, and although they were not recognised or notified as diphtheria, still I feel satisfied that in many cases they were mild forms of the disease, and by

infection gave rise to other cases of a very severe type. A bacteriological examination in these mild cases being absolutely necessary for a correct diagnosis, Mason College, Birmingham, affording great facilities for such examinations. In this connection I should like to point out the great value of the antitoxin treatment. As regards the results obtained with and without its use, there is now little difference of opinion in the medical profession in the matter, even those who were sceptical in the first instance, and refused without the strongest evidence to accept all that was claimed for antitoxin by those who first had experience of its use, have long since come round under the pressure of facts, and only those who have had no experience of the use of antitoxin in sufficiently large doses, and under proper conditions, will stand out against its use. I may bring you notice that by an order of the Local Government Board of March 23rd, 1891, if a district council is advised by its Medical Officer of Health that the use of antitoxin on persons who have been exposed to the infection of diphtheria is desirable, no sanction on the part of the Board is necessary to enable the Council to supply him with the material for use as a preventive under his general supervision, and I recommend your Council to provide the practitioners of the district with this and other preventive serums ”

The Medical Officer of Health of the Wolstanton Rural District, where 175 cases occurred, 40 of which proved fatal, writes :—“ The mortality would, in my opinion, have been much greater but for the use of anti-toxin, which I am glad to say has been used very much more this year than in previous years by the medical men in the district. The results from the use of antitoxin proves beyond a doubt the efficacy of the remedy. The spreading of the disease in families was also prevented in many cases by the injection of antitoxin as a prophylactic in other members of the family. A good percentage of the deaths from diphtheria were due secondarily to diphtheritic paralysis.”

Whooping Cough.—In the Administrative County, 258 deaths occurred from whooping cough, as compared with 294 in 1899, equal to a rate per 1,000 of the population of 0·27, as against 0·32. Of these deaths, 208 occurred in urban districts, or 0·29 per 1,000, and 50 in rural districts, producing a rate of 0·21 per 1,000. In the following table corresponding figures are given for the past twelve years:—

WHOOPING COUGH.		1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Urban	Number of deaths....	261	211	222	420	171	252	175	261	296*	220	236	208
	Rate per 1000.....	0·48	0·38	0·40	0·75	0·30	0·44	0·30	0·44	0·50*	0·33	0·34	0·29
Rural	Number of deaths....	39	68	39	90	33	38	49	59	69	55	58	50
	Rate per 1000.....	0·11	0·26	0·16	0·39	0·14	0·16	0·22	0·26	0·30	0·24	0·25	0·21

* Excluding Brownhills.

In several of the reports attention is directed to the fact that the danger of the disease is not sufficiently recognised by parents, whose carelessness and want of thought lead to needless deaths.

Enteric Fever.—This disease, which must be looked upon as entirely preventable, caused 147 deaths, as against 208 in 1899, equal to a rate of 0·15, as compared with 0·23. Of these, 121 occurred in urban, and 26 in rural districts, equalling a rate respectively of 0·17 and 0·11. In the following table corresponding figures are given for the past twelve years:—

ENTERIC FEVER.		1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Urban	Number of deaths....	106	74	111	85	117	77	129	118	86*	211	183	121
	Rate per 1000.....	0·20	0·13	0·21	0·15	0·20	0·13	0·22	0·20	0·14*	0·31	0·27	0·17
Rural	Number of deaths....	26	34	35	24	32	18	19	22	14	25	25	26
	Rate per 1000.....	0·10	0·13	0·12	0·10	0·13	0·08	0·08	0·09	0·06	0·11	0·10	0·11

* Excluding Brownhills.

The Medical Officer of Health of Bilston states that, although fewer cases occurred, the conditions which were mainly responsible for the prevalence of the disease still exist.

He also points out that the cases occurred in the poorest class of dwellings, where privy-middens prevail, and that none occurred in houses provided with water-closets.

The following extract from the report of the Medical Officer of Health of Brierley Hill should not escape the attention of the Authority, so far as it relates to the feeble attempt which appears to have been made to remove some of the causes :—“ The localities affected were : One case at Albion Street, Hold’s property, where drainage was lying over a large piece of garden ground in a very foul and sodden state, and the privies and ashpits insanitary. The defective drainage has been properly attended to, and there is now no nuisance from that cause ; but I consider the work at the privy-middens has been done in a perfunctory and unsatisfactory manner, leaving the nuisance I complained of unabated.

“ In all the other cases the insanitary condition of the privy-middens, and resulting soil pollution, appeared to be the only cause of the outbreak.”

In the Cannock Urban District 42 cases occurred, nine of which proved fatal, and the Medical Officer of Health blames the privy system as being the chief cause of the disease.

I quote the following extract from an account which the Medical Officer of Health gives of an outbreak in the Coseley district :—“ In May six cases were reported from three cottages in Parkfield Colliery. There are 24 cottages at this locality, the majority of them being dependent for their water-supply on an unprotected well, which is twelve yards from a closet. I had before reported on this well as being an unsuitable form of supply, and I found that two cow proprietors used it for washing their milk vessels, etc. I advised that arrangements should be made to secure a supply of tap water for these cottages.

“ As a first step the Sanitary Committee had the water from the well analysed, and the report stating that the water was good, it was decided that a second sample should be taken for analysis later on by the Sanitary Inspector, but I am not

aware that this has been done, and the matter remains as it was. I maintain that the supply is an unsuitable one, and even if a particular sample showed no danger on chemical analysis, the danger of its pollution at any time is very great, and the matter should be persevered in."

I would emphasize the remarks of the District Medical Officer of Health with reference to the limitation which must be placed on a purely chemical opinion of any water-supply in the face of the facts pointing to its dangerous nature. There are many waters which come within the chemical standard of purity and, at the same time, are specifically contaminated, and as in the case in question the enteric fever appeared to be owing to the water-supply, no purely chemical opinion should stand in the way of the supply being condemned.

In Darlaston, the Medical Officer of Health, under this heading, says:—"That this outbreak was due to filth emanations there can be no doubt, and amply illustrates how essential it is not only to proceed vigorously against the privy-midden system, but also to remove all accumulations of decaying organic matter as thoroughly and frequently as possible.

"The outbreak is an object lesson and teaches us again the need for hospital isolation, without which our sanitary machinery must remain lamentably imperfect."

The Medical Officer of Health of Quarry Bank, in discussing certain cases which occurred in that district, says:—"In each case the privy-midden system was in use, in most cases the ashpits were uncovered, and in one the ashpit had no apparent containing wall. The soil surrounding these houses must be frequently charged with foul ground-water and ground-air, and the entrance of the latter through the pervious floor and walls of these old houses might account for the disease. These evils would be largely corrected by the deep sewerage scheme and the adoption of water-closets, and, in the interests of the poor especially, I would urge the Council to press this matter forward."

In Tipton, also, the privy midden system is credited as being an important factor in the causation of enteric fever.

It is to be hoped that the Corporation of Wednesbury will act upon the repeated advice of their Medical Officer of Health, as again set forth in the following quotation :—“ This also would seem to be the place to remind the Council, that no effect has so far been given to my recommendations respecting the provision of proper buckets with lids, for the removal of the excreta from typhoid cases. When I reported upon this matter, I supplied the name and address of the maker of these articles together with the price. So far nothing has been sanctioned by the Sanitary Committee. Seeing that no fewer than 42 cases of enteric fever have been treated in the town during the year, it is plain that a large number of middens must have been fouled by the typhoid excrement. This must mean a real and practical danger to the inhabitants. The midden system at best is an unwholesome and dangerous arrangement, but surely it becomes much more so, if an admixture of the ordinary midden contents with typhoid excreta be permitted to occur. I would recommend that the matter should again receive the attention of your Committee ; and that in addition to the needful articles, one of the town’s servants be appointed to carry out the systematic removal of the utensils and the discharge of the excreta directly into the sewer.”

From the report of the Medical Officer of Health of Cannock Rural District, where eight cases occurred, I quote the following :—“ I reported to the Council in August upon the insanitary condition of the ash-pits in Bushbury, mostly uncovered, and leading after heavy rain to offensive nuisance, such being probably answerable for a case of typhoid in this locality.

“ Seven of the above cases were in Brewood, largely traceable to the premises of a butcher’s shop, in which I condemned the slaughter-house as being too contiguous to the dwelling-rooms, and this was emphasised by previous outbreaks of disease in the same household. The Council, acting on my advice, had twelve samples of water taken from wells in the

village and analysed, and the report thereon was distinctly unfavourable, and from this cause, and from various outbreaks upon which I have reported in former years, I adhere most emphatically to my repeated warnings as to the necessity of a complete and efficient drainage for Brewood. This will no doubt ere long be carried into operation ; and together with the same a supply of pure water for the village is imperative. With the advantage of its natural position, this village with good water and efficient drainage should become one of the healthiest localities in the district."

With reference to the advantage to be derived from bacteriological examinations in suspicious cases, the Medical Officer of Health of Kingswinford Rural District writes :—" I should like to point out that in two cases of enteric fever in which I was unable to come to a conclusive diagnosis promptly, I took advantage of the County Council's offer and sent a specimen from each case to be examined bacteriologically at Mason University College, Birmingham. In both cases the provisional diagnosis was confirmed, and I was enabled to have the cases removed to hospital and proper sanitary precautions taken a few days, at any rate, sooner than I could otherwise have been able to."

Diarrhoea.—In the Administrative County, 718 deaths occurred from diarrhoea, as compared with 1068 in 1899, equal to a rate of 0.76, as compared with 1.17. Of these, 631 occurred in urban, and 87 in rural districts, equalling a rate respectively of 0.90 and 0.37. In the following table corresponding figures are given for the past twelve years :—

DIARRHOEA.		1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.	1900.
Urban	Number of deaths...	431	454	208	301	632	210	592	423	806*	877	946	631
	Rate per 1000.....	0.82	0.82	0.38	0.54	1.12	0.36	1.02	0.71	1.37*	1.31	1.39	0.90
Rural	Number of deaths...	98	91	65	65	129	60	92	90	126	97	122	87
	Rate per 1000.....	0.40	0.35	0.27	0.28	0.56	0.26	0.41	0.39	0.55	0.42	0.53	0.37

* Excluding Brownhills.

The Medical Officer of Health of Bilston writes :—“ The causes of diarrhoeal diseases have been fully discussed in previous reports, and it is now well recognised that their prevalence has a definite relation to the temperature, and especially to the ground temperature, and this applies pre-eminently in a district like this, where pollution of the soil near dwellings, particularly in dirty ill-paved yards and courts, and in the absence of proper spouting, is common. Further, the importance of proper food for children, both quality and quantity, sufficient ventilation and light, and cleanliness of the home and the person, must not be over-looked.”

In Darlaston the disease has been less fatal than in previous years, but the Medical Officer of Health points out that “ it still contributes very largely towards the zymotic mortality.”

The Medical Officer of Health of Handsworth deals at length with the causes of fatal diarrhoea, and quotes various passages from previous reports emphasizing the importance of adopting every precaution to prevent the soil from becoming polluted. Bearing on the question of soil temperature as an important agent in the causation, he says :—“ The temperature of the soil at a depth of four feet rose to its maximum, 55.9 degrees F at the Edgbaston Observatory in the 30th week (ending July 28th). In Birmingham, as in Handsworth, the highest weekly mortality was in the 35th week (ending September 1st).”

Cholera.—No mention is made of this disease in any of the reports under review.

Erysipelas.—Little reference is made to this disease in any of the reports.

Puerperal Fever.—In the Administrative County, 53 deaths were attributed to puerperal fever, as against 39 in 1899. In only a few of the reports is any special reference made to the circumstances attending the cases.

Influenza.—Although it would appear from the reports under review that influenza again prevailed in most

parts of the county, the type seems to continue to be milder as a rule than was the case in previous years.

The Medical Officer of Health of Darlaston, under this heading, writes :—"There is a considerable increase in the deaths from influenza compared with last year. The poison of influenza is air borne, most contagious, and very far reaching in its consequences. Its prevalence, although greatest in cold weather, is really independent of seasonal influences, some of the severe visitations coming in milder weather. It is often spread by the contact of the partially convalescent with the healthy, and death is most frequently brought about by pulmonary complications. It should really be regarded by the public as very infectious, demanding as thorough a disinfection of rooms and clothing at the termination of the case as any other infectious disease."

The Medical Officer of Health of Handsworth points out that "in no disease does recklessness pay a greater penalty."

In Rowley Regis, although there were a considerable number of cases throughout the district, it does not appear that the disease assumed epidemic proportions.

Under this heading, the Medical Officer of Health of Wednesbury writes as follows :—"Epidemic, or, as we may almost say, endemic influenza, was responsible during the year for 10 deaths. This is greatly to be regretted, but up to the present time no means are available for controlling the spread of this troublesome and fatal malady. It is almost a pity that the disease has no constant and distinctive rash to indicate the presence of the poison. If this were so, the affection would be seriously regarded by the public, which at present is not the case."

Diseases of the Respiratory Organs:—Under this heading, which does not include phthisis, 3033 deaths occurred as compared with 2765 in 1899. None of the reports contain any remarks regarding these diseases which call for special reference.

Phthisis.—In only a few of the reports does the causation and prevention of phthisis receive much attention. No fewer than 869 deaths have resulted from this disease during the year, but even this figure shows a slight improvement on that of the previous year when the deaths numbered 884.

Under this heading, the Medical Officer of Health of Handsworth writes:—“We know now that tubercular diseases are preventable; that they are due to the growth in the body of a very minute organism which may be conveyed into it through the medium of cow’s milk, or more rarely by the flesh of animals affected with the disease or by the matter expectorated by persons or animals suffering from consumption. These organisms retain their vitality even when dried so that they may be wafted about in the air. Fresh air and sunlight soon kill them. In addition to the presence of the micro-organism another factor is required for infection, and that is a certain receptivity of the body. This condition of the body is, in the main, brought about by insanitary conditions, and is prevented by living in an atmosphere supplied abundantly with pure fresh air. To preserve the public health therefore, our milk and meat supplies should be beyond the reproach of tubercular infection, persons suffering from consumption should be cautioned against spitting in the street and in public vehicles or indeed on any material which cannot be burnt or otherwise disinfected, and insanitary conditions should be remedied.”

With reference to bacteriological examinations in suspicious cases, the Medical Officer of Health of Quarry Bank writes:—“The County Council have extended their arrangement with Birmingham University, so as to apply the bacteriological test for tuberculosis and enteric fever, in addition to diphtheria, free of charge, and I have on several occasions decided doubtful cases through this means.”

In view of the steps which are being taken in different parts of England in the direction of the prevention and cure of phthisis, the following remarks from the report of the Medical Officer of Health of Stoke-on-Trent are of interest:—“An effort ought to be made to encourage disinfection after

this disease ; to deal more thoroughly with overcrowding of dwelling houses ; to prevent encroachment on yard spaces by wooden buildings ; and to impress on the people the fact that the disease is transmitted by personal infection. Recently, a balcony has been erected at the North Stafford Infirmary, for a better treatment of cases of phthisis. The larger question of the provision of a sanatorium for North Staffordshire, is one that has yet to be considered."

As regards the last two sentences of the above quotation, year by year it is becoming more evident that phthisis is a curable disease, which, however, requires specialised treatment, and as individual districts can hardly be expected to provide the necessary accommodation, sooner or later it will become a question as to who shall accept the responsibility.

ZYMOTIC DISEASE PREVENTION.

Isolation and Disinfection.—In most of the reports, both for urban and rural districts, this question is very fully dealt with.

In the table at the end of this Report, headed "Result of the working of the Compulsory Notification of Infectious Diseases Act," figures are given showing to what extent isolation hospitals are made use of in districts where they exist. It will be noticed that the use made of them varies very considerably, and in most cases it is evident that they can be of little practical value in curtailing epidemics—the chief purpose for which they are intended. In some instances it would appear that patients object to go to them on the ground that the accommodation provided is not satisfactory. In other cases in which difficulty is experienced the authorities themselves seem to be the cause, owing to the fact that they take too limited a view of their responsibilities, and impose a hindrance to the isolation of infectious cases by making a charge for the admission to hospital of all persons who are not paupers.

The percentage of infectious cases isolated in urban districts where hospitals are available, and have been available

during the whole year, varies very much—from *nil* in the case of Amblecote, Biddulph, Brownhills, Darlaston, Sedgley, Smethwick, and Wednesfield, to 100 per cent. in the Borough of Tamworth.

As I have pointed out in my introduction to this report, progress in the provision of improved isolation hospital accommodation throughout the County has been at a standstill owing chiefly to the fact that the amending Hospital Bill has only recently become law, now, however, that the Council have obtained the powers they sought for, I anticipate being in a position to record considerable progress in this direction in my next annual report.

In view of the revived interest which the passing of the Amending Act has created, I propose to quote pretty fully, from the reports under review, the opinions of the District Medical Officers of Health upon this important subject.

I quote the following, from the report of the Medical Officer of Health of Amblecote, as an illustration of the inconvenience and expense which frequently is occasioned by allowing infectious cases to remain at home:—"None of these cases were removed to hospital. In the scarlet fever cases the parents were unwilling to allow them to be removed. One case should have been removed, because the father was industrial trainer at the Union House; but, as he would not consent to the removal, I gave prompt notice to the Master at the Union House, and he was not allowed to resume his occupation until he was properly isolated and disinfected. He afterwards went to reside in lodgings until his child had recovered and the house and clothing had been fumigated and disinfected." Further, the Medical Officer of Health says "When the isolation at home is not satisfactory, we try to get the cases removed, but, owing to prejudice, we do not often succeed. The hospital is not an ideal one, consisting as it does of temporary wooden buildings, but it is chiefly its proximity to the Union House which creates the prejudice."

The Medical Officer of Health of Bilston writes:—"In 1899 the question of providing a properly equipped permanent

Hospital for Infectious Diseases (other than smallpox) for this and the neighbouring districts of Willenhall and Darlaston was under the consideration of a Committee formed of representatives from each of the three District Councils, who had before it a joint report from the Medical Officers of Health concerned, in which the plan of constituting the three towns into a 'Hospital District' under the Isolation Hospitals Act, 1893, was strongly and unanimously recommended. Unfortunately nothing further has been done in the matter, though the necessity of some such provision must be admitted by all."

The Medical Officer of Health of Brierley Hill writes:— "The Isolation Hospital was erected jointly with the neighbouring district of Quarry Bank, and is managed by a joint board of the two districts. It was erected during an epidemic of smallpox in 1893, and was intended solely for that purpose. It has since been used, however, by both districts for the isolation of enteric fever cases, and has been of great advantage. A few cases of scarlet fever have been isolated, but no real attempt has been made to use the hospital for that purpose, to do so would entail the erection of another pavilion, with separate bath rooms and other offices."

In Burslem only 15% of the cases of diphtheria, enteric fever, and scarlet fever were isolated in hospital, and the Medical Officer of Health states that this proportion would have been largely exceeded had the accommodation at the hospital permitted.

The following quotation from the report of the Medical Officer of Health of Cannock Urban District indicates the need for better hospital accommodation in that district. He says with reference to the smallpox hospital:—"As already mentioned, this hospital was re-opened for the admission of typhoid patients, and a full nursing and working staff engaged. Thirty-one cases were admitted, the majority of them being from Bradbury Lane. Six deaths occurred. The last patient was discharged on January 26th of this year. The wards were consequently fumigated, the floors well scrubbed with a

disinfectant, the walls distempered, and the ceilings lime-washed.

“The matron and one of the nurses also unfortunately contracted the disease, but they recovered.

“During the progress of the epidemic, a shed with roofing of galvanized material, was erected on the hospital premises, for washing and drying purposes, and now that the lease of the hospital has been renewed for a further period of two years, it is advisable that the drainage of the building should be diverted into the sewer, by a proper system of disconnection.”

In Coseley it is said that owing to the want of an efficient disinfecting apparatus little can be done in the way of disinfection. The Medical Officer of Health also expresses the hope that an isolation hospital will soon be provided.

The Medical Officer of Health of Darlaston writes:—“The great increase in the number of cases of scarlatina notified during the year, compared with last, forces to the front the vital question of isolation, and unless some steps are taken in this direction we shall be powerless to check its progress to any appreciable extent in the future. By isolation, I mean separation of the sick from the healthy in the only rational way, *i.e.*, in hospital, and I trust that, seeing how futile home isolation is, the question of hospital accommodation will be seriously entertained.

“The occurrence of cases so mild as to pass recognition together with careless indifference as to its infectious nature, as evidenced by the way in which infected houses are visited, will explain a good deal of its prevalence.

“The inspector visits each house, institutes enquiries and always, I know, enjoins the usual absence from school, though I have reason to believe that many parents are alarmingly casual in these matters, and allow children the same liberty of movement as if nothing was the matter. The resumption of school attendance without medical consent is most unsatisfactory, and I would advise that no child be allowed to

return without the necessary medical certificate of freedom from infection. In addition much might be done by teachers sending home any child who was found peeling, or in whom any suspicious rash or sore throat co-existed."

The Medical Officer of Health of Fenton states, on the authority of the Sanitary Inspector, "that sometimes it is more like asking a favour than demanding a right to bring about the admission of patients into the hospital at Bucknall. The rule that children under three years of age cannot be admitted into the hospital until the certificate has been signed by the Chairman of the Hospital Committee, seems to me an unfortunate one; I know it is a cause of considerable delay in the removal of cases."

At Handsworth it would seem that a disinfecting station is now being erected, so that, in future, the District Council will not have to send articles to Aston for disinfection, as was done in the case of 164 lots of bedding, &c., during the year.

The Medical Officer of Health of Heath Town again points out that the hospital, which was erected for the joint use of that district and Wednesfield, is still without a proper water-supply. He also states that the accommodation is not sufficient for the two districts and that there is need of provision for isolating cases of enteric fever.

In Kidsgrove it appears that an arrangement has been made for sending cases to the Bucknall Sanatorium, I would point out, however, that the accommodation there is far short of what is needed for the area for which the hospital was provided, so that such an arrangement cannot prove of much service.

The Medical Officer of Health of Leek Urban District writes:— "The hospital accommodation cannot be described as adequate to all emergencies in times of serious epidemics. During periods when two or three epidemics of different diseases are prevalent at the same time, more available space is desirable. To meet the requirements of the growing population, an extension of the present buildings will be necessary, and should be contemplated at an early date.

“ The original plan of the hospital provided accommodation for 3 beds in each ward, or a total of 12 beds in 4 wards, and when it is considered that at the height of the epidemic of scarlet fever during last summer there was a total number of cases amounting to 26 in the hospital at the same time, it will be seen that the accommodation was stretched almost beyond its possible limits; granted that the cases were mostly mild, and were soon up and about in the grounds during the day, still there is the over-crowded condition at night; moreover, had enteric fever or diphtheria broken out in the town during that time, they could not have been admitted, for every ward was full of scarlatina.

“ In any contemplated extension, a ward set apart for doubtful cases would be beneficial, and would render our equipment for the fight against infectious disease more complete.”

In Lichfield, it is said that great difficulty is experienced in finding trained nurses to take charge of the patients under existing arrangements.

With reference to enteric fever cases, the Medical Officer of Health of the Borough of Newcastle says:—“ During the past two years there has been a difficulty in getting these patients admitted into hospital, and the greater number of poor people suffering with this disease have been nursed at their own houses, and so have been a source of danger to the other members of the household, and also to the community at large.”

Again, later on in his report, the same Medical Officer of Health writes:—“ I am pleased to say the new Infectious Diseases Hospital has been commenced, the foundations are out and there is a prospect of the hospital being built and equipped at an early date.

“ It is needless for me to say how urgently this hospital is required, but our recent experience with diphtheria cases emphasise the urgency, for I am firmly of the belief that if we had possessed the necessary isolation accommodation, the

number of cases we had to deal with would have been diminished by half, and with a similar decrease in the mortality."

The Medical Officer of Health of Rowley Regis writes:—
"The same conditions exist as mentioned in my last year's report. The joint hospital is still a thing of the future. Up to the present this Council has heard nothing further on the matter, but it is to be hoped that the hospital question will soon be dealt with, as our hospital at Tividale is showing considerable signs of decay, and I feel a delicacy in asking for any considerable sum of money to be spent on it, if it is to be dispensed with in the near future.

"During the past year 19 cases of enteric fever were treated at the hospital, viz.:—4 who were in hospital before January 1st, and 15 who have been attended since. Five of these died and 14 were discharged convalescent. The Council have again afforded me every facility for the conduct of the hospital, which I trust has been carried out to our mutual satisfaction."

The Medical Officer of Health of Rugeley writes:—
"Isolation such as could be attempted at home was aimed at where circumstances permitted it, and whilst on this subject I am obliged to express my disappointment at not being able to report progress in the attainment of an isolation hospital. Rugeley Urban District Council still awaits the action of the County Council in this matter, and nothing can be done until an Act, amending the Isolation Hospitals' Act of 1893, before Parliament, becomes law. It would be unwise, in my opinion, on the grounds of both economy and efficiency for an Urban Authority such as yours, with a population of less than 5,000 and a rateable value of £13,000, to undertake of itself the provision and maintenance of a hospital which, to be up-to-date in efficiency, would entail an expenditure out of proportion to its possible requirements, as it would be to build or acquire an inferior kind of substitute for the purpose. I maintain, that if ratepayers are required for Public Health purposes to remove

their suffering friends or children to an isolation hospital, they should at least be guaranteed comfort and skilled treatment, and this the scheme of combined areas promulgated by the Sanitary Committee of the County Council appears to me to offer.

“The provision of a steam disinfecter is a need which I think your Council may well give its mind to, as every year has brought with it instances of recurrence of infectious disease through the want of means, other than destructive ones, of dealing with infected clothing and bedding, and the latter alternative, which would be a yearly expense to your Council, I feel I must adopt if a proper apparatus is not provided; such an one might be obtained for an outlay not exceeding £150”

The Medical Officer of Health of Sedgley writes:—“The cost of notification during the past year amounts to £11 7s., not an excessive sum for the first line of health fortifications for the community. The second line of fortifications, viz., hospital accommodation, has not yet been secured, but doubtless ere long the advantages of the Isolation Hospitals’ Act of 1893, or of some Act founded on it, will be obtained. I beg to repeat my recommendation of previous years, that efficiency and economy can best be secured by combining with neighbouring localities for hospital purposes.”

The Medical Officer of Health of Short Heath states that a projected scheme for providing hospital accommodation jointly with adjoining districts has been abandoned, and that the district is still without a hospital.

The Medical Officer of Health of Smethwick gives an account of the steps which are taken to limit the spread of infectious diseases, and concludes as follows:—“It is gratifying to me to find that my visits are, generally speaking, looked forward to, and that the advice I tender is appreciated. Of course if a scarlet fever hospital were available this personal care and watchfulness would be still required, but at the same time the health of the Borough would be most certainly much

more efficiently protected, and the comfort and convenience of those in whose houses infectious diseases have occurred would be beneficially and profitably promoted. It is impossible to conclude that the mere provision of such a hospital would stamp out scarlet fever, but most certainly the provision of one would be a great boon, alike to the Borough and the affected household, by enabling, through the then possible removal of the sick person, the other members of the family to continue uninterrupted their several occupations, without danger to the general public."

The Medical Officer of Health of the Borough of Stafford writes:—"I was not able to isolate a single case of typhoid fever, as there is no separate accommodation provided for that fever. Several of the cases wished for treatment in hospital, and they had to be refused admission. Typhoid fever requires both isolation and skilled nursing, and how are these to be obtained in a house with only two bedrooms, and where there is a small family? It is very necessary that steps be taken without delay to provide the accommodation that is required."

The following quotation from the report of the Medical Officer of Health of the Borough of Stoke-on-Trent, one of the constituent authorities of the Hanley, Stoke, and Fenton Joint Hospital Board, is well worthy of the attention of the Corporation and the Hospital Board:—

"The method of charging for each patient, ensures that the Authority which makes most use of the hospital shall pay most to the up-keep of the institution; but it tends to discourage full use of the hospital, as the question of expense is always present. On the other hand, if the total expense incurred at the hospital were divided among the Authorities, according to their rateable value, it would tend to encourage the use of the institution. The utmost use should be made of the hospital.

"The only ambulance available for removal of patients to the isolation hospital, is the one kept at the hospital, 3 miles from this Borough. It is used by the Joint Authorities, and

frequently the prompt removal of patient has been impossible, as the ambulance accommodation was not sufficient, especially in view of the rule which compels us to have the admittance order, in the case of children under 3 years of age, countersigned by the Chairman of the Joint Board. No child under 3 years has ever been refused admission, and the rule might be done away with, to our advantage.

“The rule, that the order for admission, signed by the Medical Officer of Health, must actually be taken with the patient to the hospital, has also caused delay in removal of cases. The order might more conveniently be sent by post.

“Again, the rule that no parent is allowed to accompany a child to the hospital, though possibly a good one in most cases, might, when the necessity arises, be relaxed with advantage. In one or two instances, the ambulance has had to return to the hospital without the child, when, had the parent been allowed to accompany it, no difficulty would have arisen.

“The question of the appointment of a Resident Medical Officer, in addition to a Visiting Physician, is one that I hope will receive the favourable attention of the Joint Committee in the near future.”

The Medical Officer of Health of Stone Urban District, writing with reference to the temporary hospital which has been provided by that district and the rural district jointly, says that an enlargement of the hospital is desirable, so that more than one class of infectious case may be isolated at the same time. It appears that a new ambulance has been provided, which is said to be a great improvement upon the old one.

The Tamworth joint hospital would seem to be well kept up, but, according to the Medical Officer of Health, “the roadway from the Moore Lane gates to the hospital is much in need of repair, as the jolting over the ruts is not conducive to health or comfort.”

The Medical Officer of Health of Tipton writes:—“The Hospital is fulfilling the object for which it was built, but is

not as generally used as it should be. It is kept clean, and patients with different diseases can be isolated. It is, however, far from being furnished with the equipment of a modern infective diseases hospital. A proper disinfecting chamber is much wanted, and a separate block would be of great advantage for isolating patients who may be suffering from some infective disease differing from any which may be under treatment in the general wards.

“I expect that the new rule for gratuitous admission of all but pauper patients will much extend the usefulness of the hospital. I know that the system of expecting a payment, however small, has deterred patients from seeking admission heretofore, and I feel sure that the district will not suffer by the little extra cost, but that this will be more than repaid by our being able to quickly remove foci of infection, and so prevent very poor patients, who may be unable to resist infection, from coming on to the rates. An urgent want is that of an ambulance carriage; our present system of removal is not at all satisfactory. If we could have a proper ambulance carriage it could be horsed by one of the horses now used by the Council, and removal be effected in a more decent manner. This year the amount we have paid for cars would repay the interest on the outlay for a carriage.”

The Tipton District Council are to be congratulated in having determined to make no charge in future for admission to the hospital, a policy which the Sanitary Committee of the County Council have for years urged them to adopt.

The Medical Officer of Health of Tunstall states that owing to the strain upon the limited number of beds in the hospital, he has not been able to remove so many cases as ought to have been isolated there.

The Medical Officer of Health of the borough of Wednesbury writes:—“I am pleased to say that the Hospital was not called into requisition during the year for the treatment of smallpox patients, no case of the disease having arisen. Acting, however, upon the authority entrusted to me, I authorised the

admission to our wards of five cases of scarlatina, which were being treated outside under wholly unfavourable conditions. Three of the cases were removed from 3, Addison Street, where other brothers and sisters were in the same house, under the sole care of the mother. Of these three cases, one aged 2 years died fourteen days after admission. The fourth case, a lad from 65, Church Street, was under the care of his widowed mother, who also superintended the remaining four or five children and managed a small shop. The fifth case came from 2 Court, 6 House, Bridge Street, and was in equally unfavourable surroundings. Towards the end of the year I attended a meeting of the Sanitary Committee to explain the circumstances under which I had admitted the cases to Hospital. At this meeting a discussion took place which indicated a feeling in favour of erecting special hospital accommodation for the treatment of scarlatinal cases, where the home accommodation might be insufficient. I can only now express a hope that the matter may go further than mere discussion, and that the Sanitary Committee may shew their seriousness of purpose by giving practical effect to the feeling then expressed. I may say that the average duration of the treatment in hospital of the scarlatinal cases was six weeks.

“I take this opportunity of reminding the Council that so far my suggestions with reference to the polishing and improving of the hospital floors have not been carried out, nor has a suitable ambulance been provided. Possibly before my next Annual Report becomes due, these defects may have been remedied.”

The Medical Officer of Health of Willenhall very properly calls attention, in discussing the precautions which were adopted to curtail the spread of measles, to the inexpediency of making a charge for disinfecting schools. He writes as follows:—“All the schools were cleansed and disinfected with sulphurous acid by the Sanitary Inspector, for which I am informed a charge of 15s. was in each instance made by the Council. It is difficult to conceive on what grounds a charge is made for doing that which is so obviously for the public wel-

fare, and the more so when it is borne in mind that no charge is made for the disinfection of dwelling-houses. If any charges are made for the disinfection of Board Schools, the cost is paid by the public, and it can make no difference to the public whether it is raised through the district rate or the poor rate ; whilst if any cost is incurred by Voluntary School Managers it is raised from other sources, and the Voluntary Schools are to that extent handicapped by the public authority."

With reference to isolation and the disinfection of clothing, &c., he says :— "The scheme for the establishment of an isolation hospital, proposed jointly by the Medical Officers of Health for Willenhall, Bilston, and Darlaston Urban District Councils in 1899, has not been accepted. I can therefore say nothing more on that subject for the present.

"A site for a smallpox isolation hospital has been secured between Portobello and Bunker's Hill, but no hospital is in readiness to receive patients. The most I can say for the site is, that a hospital there will be better than no hospital at all. The surroundings are not pleasant, and it is not far enough away from a considerable centre of population to be effectual in preventing the spread of such a contagious disease. It is probable no suitable site can be found in Willenhall. Whether a suitable site could be purchased in Bentley, Wednesfield, or Essington, I don't know, but these are the places in which to make inquiries.

"The disinfecting apparatus was useless all the year. I understand the Council has applied to the Local Government Board for a loan, and has decided in the event of obtaining it, to purchase a Washington-Lyons Disinfector, and to build a suitable place for its proper equipment."

The Medical Officer of Health of Cannock Rural District writes :— "I submitted a report early in the year to the Council as to the provision of a hospital for infectious diseases, recommending a permanent building, the provision of 20 beds, and a central site. I considered the question from the point of view of—(1) the Council providing for themselves alone ; (2) the

co-operation with Cannock Urban and Brownhills Urban. The Council appeared to be in favour of their own hospital, independent of their neighbours, and a committee has been investigating several sites for the purpose. Meanwhile the Council have not seen their way to take definite action, although convinced as to its importance and necessity, as evinced by their passing of a resolution to provide an isolation hospital for their district alone. The Council have also decided to renew an existing agreement with the Urban Council of Cannock for the joint tenancy of the hospital situate in the Cannock parish, and which has been used for smallpox and enteric cases, mostly from the urban area."

In the Seisdon Rural District it is said that the hospital continues to gain favour, and that most of the cases are sent in as a matter of course. The Medical Officer of Health, however, calls attention to the need for some provision being made for the isolation of smallpox cases.

The Medical Officer of Health of Wolstanton Rural District writes, under the heading "Scarlet Fever," as follows : — "This disease has been very prevalent during the year, 369 cases having been notified as compared with 362 during the previous year. Of these cases I was able to remove 47 cases to the Sanatorium. I should have liked to remove more cases, but for lack of accommodation I was unable to do so. I am glad, however, to state that in most of the cases removed the parents were willing, and in many cases even desirous that the children should be removed to the isolation hospital. This tends to shew that the prejudice against isolation hospitals is fast dying out."

In the same report the need for further hospital accommodation, especially for diphtheria cases, is again referred to.

Vaccination.—It would appear from many of the reports under review that the new Vaccination Act has been instrumental in increasing the number of vaccinated children, and if one were satisfied that all vaccinated children were efficiently vaccinated a considerable advance in this depart-

ment of public health might be recorded. I fear, however, that in many districts the operation is still very inefficiently performed, owing to what one must characterize as dishonesty on the part of certain practitioners. The proportion of such cases, however, is probably not greater than formerly, and on the whole it must be admitted that the Act has served a good purpose. At the same time, it is much to be desired that some guarantee should be enforced which would ensure greater efficiency when the operation is performed by private practitioners.

The Medical Officer of Health of Biddulph writes:—"By the courtesy of Mr. Shaw, the Clerk to the Guardians of the Leek Union, and Mr. Nixon, the Vaccination Officer, I now give the figures for the last three half years. This is only possible owing to Biddulph being also a separate vaccination district; in the majority of places the vaccination districts do not coincide in area with the sanitary districts; and so the vaccination returns cannot be made to fit the sanitary districts. Moreover, vaccination is under the control of Boards of Guardians, and Medical Officers of Health have no right, as such, of access to the figures. Whilst personally always willing to do anything in my power to obtain information for my annual reports, I respectfully protest against the system, which grows more extended and more onerous every year, of being asked by the higher authorities to furnish information which I can only obtain by begging for it as a favour from the officers of other public services. Undoubtedly the law ought to provide for the official supply to the Medical Officer of Health of *all* information which he is expected to publish afterwards. It is all very well to say that 'a little tact' will get over the difficulty; I maintain that there ought not to be the possibility of any difficulty."

The remarks just quoted are well worthy of the serious attention of the Local Government Board, and they apply equally forcibly to other important matters concerning which no legal provision is made to insure that Medical Officers of Health obtain the required information.

As regards the statistics, the same Medical Officer of Health writes :—“ There are one or two points of interest to be noticed. Only one conscientious objector has been found during a year and a-half out of 330 cases ; three children (or less than one per cent.) have succeeded in evading the vaccination officer. The number of postponements shew such a marked diminution that it makes one suspect that some of the earlier ones were possibly somewhat irregular, and 234 children (or 71 per cent. of births) were satisfactorily accounted for in the first six months of life. If those who died be deducted, the percentage becomes 80. And assuming the ‘postponed’ and ‘removed’ cases to have been satisfactorily dealt with subsequently, which is a perfectly reasonable supposition, 98·6 per cent. of surviving children will be accounted for.”

The Medical Officer of Health of Bilston gives comparative figures for ten years, and says :—“ These figures shew a satisfactory position with regard to the quantity of vaccination that cannot be excelled ; the quality, however, in some cases, is not all that could be desired.”

The difficulty referred to by the Medical Officer of Health of Biddulph is also mentioned by the Medical Officer of Health of Brierley Hill, who writes :—“ Several years ago I applied to the Vaccination Officer for the figures for Brierley Hill for one year, and offered him a fee of 2s. 6d. He declined the offer, stating that the statistics were not kept separate, and the fee I offered was insufficient. As I did not think it was worth more I have not made another application, and I do not know exactly how the question stands ; but I believe the vaccination of the district is very well done, and the ‘Conscientious Objector’ is not much in evidence.

“ There is a practice, however, of taking children to be vaccinated with one mark, which is very unsatisfactory. The children are taken outside the district to have it done. There are no one-mark vaccinators in Brierley Hill. The mothers do it, I believe, from feeling of affection and from no other motive ; but it is almost, if not quite, useless as a preventive against smallpox. If the practice cannot be stopped, it would be

much better for these people not to have the children done at all, as we should then know where the unprotected people are and get them vaccinated if smallpox did break out. This inefficient vaccination should, however, be dealt with by the Vaccination Authority, and you might call their attention to it."

The Medical Officer of Health of Coseley writes :—" I am sorry to say that many children are vaccinated so ineffectively as to be robbed of the protection which the operation, when properly carried out, confers."

The Medical Officer of Health of Handsworth writes :— " The continued decrease in the number of defaulters is highly satisfactory. Again one feature of the last return is unsatisfactory, namely, the great number, 92, of untraced removals. This feature shows the increasing number among us of a migratory class of people who are, as is known from experience elsewhere, a fruitful source of infectious disease.

" It is to be hoped that the ' defaulters ' will reconsider the subject of vaccination, and will submit themselves and their children to vaccination and re-vaccination, so that they may be preserved from the risk of disfigurement, maiming and death, involved in an attack of smallpox."

The Medical Officer of Health of Quarry Bank says :— " There is no reason to believe that there is much improvement in regard to vaccination. The practice, especially with young mothers, of insisting on one mark only (to attain which end they will wander from their family doctor to outside districts) is prompted no doubt by affection, but is born of ignorance. When smallpox appears, their children will be found illprotected, and disfigurement, or perhaps death, will prove at what cost they neglect the means, which, in the opinion of those most competent to judge, are the only practical barrier to the ravages of smallpox."

The Medical Officer of Health of Rowley Regis writes :— " There is an increase of 61 unvaccinated children this year over last year's returns.

"The practice of vaccinating so as to produce only one vesicle is carried out very extensively, especially in the lower division of the parish. The value of the protection afforded by this mode of vaccination can only be tested by a smallpox epidemic."

The Medical Officer of Health of Stoke-on-Trent points out that in the four-and-a-half years, from January, 1896, to June, 1900, 574 children remain unvaccinated out of a total of 3619.

From the following quotation from the report of the Medical Officer of Health of Tipton it is evident that if smallpox should break out in that district the consequences will be serious. He says:—"The western portion of the parish is better protected than the eastern, where the rule is for parents to take their children to practitioners who only vaccinate in one place.

"The parents will not, as a rule, consent to four separate scarifications being made, a few will allow two to be made, but only after great persuasion. The visit of the vaccination medical officer does not make any difference, time after time they will call to find the door closed. I sometimes think that an epidemic of smallpox would teach them a salutary lesson as to the value of vaccination."

The Medical Officer of Health of Wednesbury writes:—"The vaccination record for the year ending June 30th, 1900, is very similar to that of the previous year, and does not shew such an improvement as I anticipated. The fact that there were 159 defaulters who refused vaccination, taken together with the fact that no prosecutions were instituted by the persons responsible for the proper working of the Vaccination Acts, shews that no proper system has been followed, and that means created for giving effect to the requirements of the Act have been completely neglected. I feel it my duty to speak here of the uniform excellence of the calf lymph supplied by the Government, the results obtained by its use have been all that could be desired. Of the total number of vaccinations

done, it must not be forgotten that a considerable number consisted in vaccination in one place only. Experience has shewn that the protection against smallpox thus afforded is very transient, and such a practice cannot be too strongly condemned. My reason for emphasising this point again and again is that when we presently have to deal with the inevitable visitation of smallpox, a number of such imperfectly-protected persons will certainly contract the disease. The opponents of vaccination will adduce such cases as evidence of the inefficiency of vaccination, and thus endeavour to bring the operation into disrepute. Hence I consider it advisable to keep the point prominently in evidence. With regard to vaccination by one insertion I may say that such a practice should be prohibited. Probably in order to do this effectively, public Vaccinators throughout the country should bring the matter before the General Medical Council who might be disposed to insist upon the abolition of the practice."

The Medical Officer of Health of Wednesfield says:—
"There does not seem nearly so much objection on the part of the public, now that the operation is performed with calf, instead of with human, lymph, as in the past, but, at the same time, there is a very great objection to have more than one, or at most two, marks on the children's arms."

The Medical Officer of Health of Willenhall writes:—
"Three hundred and fifty one children were successfully vaccinated, 32 certificates of exemption were made by Magisterial order, and 10 certificates of insusceptibility were received. Considering that the births of 697 children were registered, of whom 118 died before they were a year old, these figures are far from satisfactory. They mean that approximately one-third of those born have not been successfully vaccinated. Is there a laxity in the administration of the law on this subject? Cannot the Council bring some pressure to secure compliance with the law?"

The Medical Officer of Health of Cannock Rural District says:—"Without giving any figures I can speak well of the working of the new Vaccination Act in this district. Little

friction is engendered; the number of exemptions are not great; and the system of domiciliary visitation, with the use of calf lymph, answers well."

INSANITARY DWELLINGS AND OVERCROWDING.

It would appear from the reports under review that the provisions of the Housing of the Working Classes Act, 1890, and the Public Health Act, 1875, in regard to insanitary dwellings, are receiving increased attention; still, there is room for greater activity on the part of authorities, especially of rural districts, in condemning insanitary property.

The Medical Officer of Health of Bilston writes:—"During the year 15 houses were certified by me under the Housing of the Working Classes Act, 1890, as unfit for human habitation, and 13 cases of overcrowding were corrected.

" It cannot be denied that there is a considerable number of dwellings in this district which require closing, but the difficulties in the way are enormous. The wages of the poorer classes do not allow them to pay rents sufficient to procure houses large enough for their families, and, in many cases, they have no choice but to reside in some that are not really fit for habitation, with the result necessarily, of increased sickness and high death rate. Not unfrequently too, their habits and mode of life would soon reduce the best of dwellings, if they were fortunate enough to be able to secure them, to dilapidated and miserable homes. These difficulties are increased by the present high price of building materials, the depression in trade, and the general financial outlook, both locally and throughout the country. To close many of the existing houses, bad though they be, or to bring about any extensive demolition of insanitary property, would aggravate the evil by raising the rents of the cheaper houses that remained, and would cause still further overcrowding. Before any such steps can be safely taken to any great extent, much improved accommodation is required. One of the great social problems of the immediate future, and it concerns us in a pre-eminent degree, is the provision of cheap sanitary dwellings in more open spaces,

at rents within the reach of the poorest. Local philanthropists who would erect these, be content with small dividends, and who, further, in return, would insist upon continued cleanliness on the part of the tenants, in and around the home and on the person, would confer a lasting boon on this community, and tend to improve the health and morals of the people."

Under the heading of "Housing of the Working Classes," the Medical Officer of Health of Brierley Hill writes:—"The demand for this class of houses is always good, and it is an extremely rare thing to find one unoccupied. Generally speaking, there is plenty of air and sunlight about the houses. All new plans are examined by the Medical Officer of Health and Surveyor before they are placed before the Sanitary Committee for approval. For several years there has been a much more careful and thorough supervision over new buildings.

"Land has been offered for sale during the last two years, and new streets are in course of formation, which provide a large number of building lots. The price asked for these lots, however, is prohibitive for houses which the working man can afford to rent.

"There are a good many old properties the sanitary condition of which leaves much to be desired. Many of them are occupied because there is nothing else to be had. There is room for houses at a rental from 3s. 6d. to 5s. per week, which I think would be readily taken up. The provision of such houses would compel the owners of old and insanitary properties to make such improvements as would enable them to compete with the newer and more sanitary properties.

"These older properties are generally occupied by the most improvident and careless of the population, and living in insanitary surroundings increases their evil habits. This class of property requires more constant and regular supervision, and more regular and periodic attention to limewashing and cleansing.

"The most prominent shortcomings in our sanitary work lie in attention to detail. When structural alterations are

required for the abatement of nuisances, I often find the work is carried out inefficiently, the cheapest and most ready means being that which commends itself to the owner, and there is consequently an early recurrence of the nuisance.

“ We want more definite and precise conditions specified, when notice to abate nuisances is given, to carry out the work on specific lines, and not according to the often ignorant idea of the property owners, most of whom have very little respect for the permanent benefit of good sanitary work. I have condemned privy-middens, and recommended that they be pulled down and re-erected, but on my next visit I find they have been patched up with poor and perishable materials, and my object of clearing away the ‘vile thing,’ with its attendant air and soil pollution, frustrated.

“ It is this difference between temporary abatement and permanent abatement of nuisances, requiring structural alterations, which I think might be usefully considered by a small committee and a more precise understanding arrived at. There are other points in connection with the sanitary condition of workmen’s houses where I think reform is needed. For instance, I think the pantries are usually inadequate poky little holes, without light or ventilation, and often situated perilously near to drains and privies. Where cellars are used for pantries they are frequently damp. It is important that these places should be inspected and cleanliness encouraged.

“ The sinks are built of bricks and cement. After a time the cement decays and the brickwork gets loose, and a constant nuisance results. I would like to see all these brick sinks removed and a solid glazed sink substituted, a practice which is now generally adopted in most towns.

“ In the better class of artisan dwellings it has become the practice to convert what used to be called the ‘wash-house’ or ‘brewhouse’ into a kitchen, by putting into these places cooking grates, and converting what should be the kitchen into a second parlour or sitting-room. The result is that all the cooking is done in the most insanitary place in the home,

and in the early hours of the day it becomes the living room, children often taking their meals in it. If these cooking grates are to be permitted, I think the sink and the soft-water cistern should be removed to another building; in fact, a separate 'wash-house' should be built. In this class of houses, where there are too good rooms, I think it would be right to insist upon the cooking grate being placed in one of these, and the wash-house only used for the purpose for which it is intended."

I have quoted from this report pretty fully because there appears to be evidence of the absence of sufficient supervision to insure that the work which is ordered to be done has been properly carried out. This is a question to which the Authority should give serious attention.

It would appear from the report of the Medical Officer of Health of Brownhills that the Authority are still inclined to close their eyes to the serious sanitary defects which prevail throughout the district, notwithstanding the repeated protests which they have received from the County Council. I quote the following from the report of the Medical Officer of Health in support of this statement:—"There are still many houses in the district that I would gladly see closed. Those that stand back to back, and have insufficient water, should be at once closed till the landlords put them in repair to satisfy your Authority. In these cases I urge you to spare not. In many the roofs and spouting are in fearful repair. I would also call your attention to some of the houses in St. James's Place. The condition there is horrible in the extreme. The privies are something too awful, and the wonder to me is that the residents are not continually ill with zymotic diseases. That they are healthy can only be accounted for by the fact that there is much air space to the back. In such an area the paving of the courts should be enforced."

Under the heading of phthisis, the Medical Officer of Health of Coseley writes as follows:—"Dampness of houses, which contributes largely to the occurrence of this disease, is a great evil in this district. This arises from several causes,

notably absence of paving in entries and back yards, with inefficient drainage, the practice of surface-drains running down entries contiguous to the wall of the house on one side, the absence or defective condition of eavespouting, and of proper damp-proof courses. All these evils are preventable, and the erection of new dwellings requires careful supervision to see that none of these defects are present.

"In this respect I am glad to have the assurance of your newly-appointed Surveyor that new buildings are having his close attention, and it is for the Council to consider whether the means at present at his disposal for getting about his work are sufficient to enable him to perform such duties satisfactorily. I hope that new bye-laws, which I understand are now under consideration, will soon be in force."

In the Borough of Newcastle, an important scheme is in contemplation, as appears from the following quotation from the report of the Medical Officer of Health:—"No houses were closed during the year, but there still remains much work to be done by the Committee for the improvement and demolition of some of the older cottage property in the Borough.

"It is with much satisfaction that I know steps are now being taken to carry out the Lower Green Improvement Scheme, as this will result in a much-needed improvement in what I have always considered a dangerous area.

"When this is completed, I trust the Committee will deal with other insanitary areas in a similar manner."

Under the heading of phthisis, the Medical Officer of Health of Sedgley writes as follows:—"Damp houses and overcrowding are potent factors in fostering it, and there are still many houses requiring spouting, while overcrowding is not unknown. With another large scheme (viz., that for sewerage) requiring early attention, it cannot be expected that this Council should take the initiative in providing workmen's houses. Besides, the recent increased cost in building prevents private individuals from building, but the subject is

so pressing all over the country that some legislation is expected to relieve the situation at an early date."

The Medical Officer of Health of the Borough of Stafford writes as follows:—"This subject has been before the Town Council for three years. It was dealt with fully in my report for 1898, and, I am glad to say, substantial progress has now been made in the matter. The Special Committee, appointed in May, 1899, to get out plans and estimates for Artisans' Dwellings, recommended the erection of thirty-one cottages on land in Crooked Bridge Road belonging to the Corporation, and that they should be let at a rental not exceeding 4s. per week, to include all rates and water rent, and that any sum required in excess of such rental, for interest on loan and the provision of a sinking fund, be provided out of the rates. The Committee's recommendation has been adopted by the Council, and it is hoped the sanction of the Local Government Board will soon be obtained to raise the necessary loan. The dilapidated property in Broad Eye, belonging to the Corporation, has been replaced by nine new cottages, and they are now ready for occupation. Six of these cottages are to be let at a weekly rental of 4s. 3d., and three at a rental of 4s. 6d., including rates and water rent."

The Medical Officer of Health of Tamworth writes:—"The improvement scheme undertaken by the Corporation, under part 2 of the Housing of the Working Classes Act, 1890, embracing the purchase and removal of the Bradbury Square insanitary area, is now approaching completion. The sum fixed upon and paid for Bradbury Square was £1,020. The old tenants who previously occupied the cottages on the condemned area have all been housed, the cottages have been pulled down, and the work of clearing the area is progressing.

"A field of land having been purchased at a cost of £850, as stipulated by part 2 of the Act, twelve dwellings, suitable for the working classes, and more than sufficient to meet the requirements of the displaced tenants, have been erected by the Corporation at a cost of £2,348, and the new street named Bradford Street has been made, sewered, metalled, channelled,

and kerbed throughout its entire length at a cost of about £800. The houses have all been let at a rental of 4s. 9d. per week for the middle, and 5s. per week for the end houses."

It appears from a subsequent paragraph in the same report that there is need for further action in this direction. The Medical Officer of Health also states that a municipal common lodging-house is much needed.

The attention of the Willenhall Urban District Council is called to the fact that nothing has yet been done to improve Nos. 3, 4, and 5, Bow Street.

The Medical Officer of Health of Walsall Rural District writes:—"Twenty-one cases of overcrowding were brought under my notice, compared with 22 cases last year. The provision of suitable house accommodation is a very serious question in such a district as ours, where every available tenement is occupied, and where so little building is being carried on. It is little use telling people who have large families that they must get larger houses if there are not such houses in the district obtainable, consequently sanitary officers are very handicapped in dealing with this nuisance."

EXCREMENT AND REFUSE DISPOSAL.

I have called attention in my preliminary remarks to the satisfactory advance which has taken place in the system of dealing with the excrement and refuse of districts. This subject has received considerable attention in my previous reports, but as it is one of such supreme importance, from a health point of view, I propose to notice, very fully, the paragraphs under review which deal with it.

The Medical Officer of Health of Amblecote states that privies should not continue to exist in such a district, and that full advantage will not be derived from the sewerage system until every closet is connected with it.

The Medical Officer of Health of Audley hopes that when the sewage disposal plants are in proper working order privies will be abolished in favour of the water-carriage system, as such

a change would simplify what is now a serious difficulty. At present the excrement and refuse removal is unsatisfactory, and it would appear that the District Council have not made adequate provision for the work being done systematically.

The Medical Officer of Health of Biddulph states that the Congleton Peat Pail system, described in his report for 1898, continues to be much appreciated ; 65 pails have been added during the year, the number now in use being upwards of 283, of which number 233 were supplied by the District Council.

The Medical Officer of Health of Bilston writes :—“ An idea of the various methods for the collection and storage of excrement may be gathered from the fact that there are in use in this town, approximately, about 1,255 ashpits, 955 privy-vaults, 455 privy-middens, pans or pails 386, model privies 301, water-closets 159.

“ Many of the older ashpits are too near dwellings, and are of such enormous size that excrement can, and is allowed to, accumulate for months, but under the new Bye-Laws this, fortunately, will be impossible, as no further structures of this character can be erected. The distance from dwelling-houses at which ashpits and privies can be built even under the new Bye Laws (‘ six feet at the least ’) is still too small. As to the pans or pails, the system in force in removing them is most abominable. They are simply carried and emptied into a night-soil barrel and returned to the closet. No cleansing or disinfection is even attempted, with the result that they are when empty nearly as great a nuisance as when full. Until the system is abolished this should at once be remedied, either by increasing the number of pans available so that a fresh one can in every instance be supplied for the old one, and the latter not again used until it has been taken away and thoroughly cleansed and disinfected, or, better still, by introducing what is known as the ‘ Congleton Peat Pail.’ These pails are made of wood ; each contains one-fifth its volume of finely powdered and carefully dried peat dust, acidulated with ten per cent., by weight, of common sulphuric acid. The pails are in duplicate, and are changed once a-week. The peat

absorbs all moisture as fast as deposited ; the sulphuric acid fixes the ammonia given off by decomposing urine. The pail contents are thus always dry and almost inodorous, and when emptied are found to have largely combined together into a kind of humus, which forms a valuable manure. For property where water-closets are impossible, this is said to be an excellent method of dealing with the excreta, and is superior to cesspools, privies, ordinary pails, etc.

“ Further, the practice of ‘ tipping ’ the privy and ashpit refuse is most objectionable. It is customary in removing midden refuse to mix the ashes and foecal matters together and then to cart them away to some piece of vacant land, where they are covered over with rubbish. The deposit of this refuse in the first instance in the roadway itself is a great nuisance. It is necessarily offensive, leaves the surface in an objectionable state, and pollutes the air and soil near to and around dwellings—more especially is this the case in the smaller courts and narrow streets, where the movement of fresh air is always too small, and the soil is frequently already soaked with filth. The dangers of this to the public health cannot be over-estimated, and they are naturally intensified in the warmer weather. Much of the land used for ‘ tipping ’ is levelled and used for building purposes long before it is safe, and in such cases it should be made compulsory on the builders to cover the site of the dwelling throughout with proper concrete.”

Again, in the same report, under the heading, Sewerage and Drainage, the Medical Officer of Health says :—“ It will thus be evident that the question of the sewerage of the district has now reached a serious stage. Portions of the town, *i.e.*, Moxley, Millfield’s Road, and part of Wellington Road, are not sewered at all, and in other portions the sewers are old and in a very bad state. The methods of treating the sewage are antiquated, though experiments are being made with double bacteria contact chambers. The matter has long been under consideration and now requires prompt attention. The water-carriage system could and should then be made universal, privy-middens and privy-pans should be abolished, and for the ashes,

dry ashpits, or, better still, galvanized dust-bins of small and uniform size, necessitating regular weekly removal, should be introduced. By these means a thorough system of refuse removal could be adopted, whereby ashes from the houses in certain streets or groups of streets, could be emptied regularly on certain specified days ; and if dust-bins were used they could be carried out and emptied direct into the carts, without being deposited on the road at all. The refuse should then be conveyed immediately to a destructor (which ought to be erected at the same time) and there burned. Until this is done the question of refuse disposal will never be satisfactorily settled.

“ In the meantime there is one matter that can and ought to be dealt with without further delay. Many of the courts and yards are always in a dirty state, with accumulations of filth and stagnant water. Under the new Bye-Laws, confirmed by the Local Government Board on November 17th last, the Council now, for the first time I believe, has the power to compel owners to properly pave and drain the yards and courts, and I would suggest that the Sanitary Inspector be instructed to specially visit these at once, and in every case where necessary, to serve notices upon the owners to comply with this regulation. At the same time he should insist on ashpits now in use being properly covered and rendered water tight.”

The Medical Officer of Brierley Hill writes :—“ The contract for this work is now coming to an end, and I hope some better means will be found of dealing with this vexed question. I do not know that the contractor has done any worse, but he has not improved ; and perhaps if the Council had not themselves put on some extra workmen in the autumn he would have been quite unable to cope with the work. I hope the Council will seriously consider the advisability of employing their own servants to do this work under a reliable superintendent. It is not work for the Sanitary Inspector, excepting to visit the places and report if the work is not properly done.

“ I would again remind you that this work can be very greatly relieved by putting all the privies and ashpits in a more sanitary condition, and remedying the defects which I have so

frequently called attention to, such as wetness, size, and difficulty of access."

The following serious statement appears in the report of the Medical Officer of Health of Brownhills :—" In looking to future sanitary legislation, I cannot too strongly urge upon you the provision of proper and isolated tips for refuse disposal. This I urged last year, but little has been done. I have even seen the employees of the Council taking the ashpit refuse direct from the ashpits and using the same to make new foot-paths on the main roads. In a district like this, where pit banks are so abundant, this should surely be unnecessary. In one case I saw a labourer taking the refuse from the ashpit of a large school to make the pavements up. I feel sure nothing could be more likely to spread disease through our area. I am sorry that many complaints reach me as to the removal of the refuse. This I find is frequently done during the day instead of at night. To say the least of it, it is most disgusting to sight and smell, and ought to be absolutely forbidden. I get, also, many complaints that the work is not done often enough, and I can corroborate this in many cases by my own observation. I do urge you strongly to take this matter up. Nothing can be more important than the frequent and early removal of this refuse from crowded areas such as Ogley Square and St. James' Place."

In Burslem it is said that the conversion of cesspools into closets of a more sanitary nature has been more vigourously proceeded with than in any previous year.

The Medical Officer of Health of Darlaston makes the following satisfactory statement :—" No privies have been erected during the year, but 102 water-closets have been fixed, of which between 30 and 40 have been substituted for previously existing privies. The work of house connections also has made progress, 164 houses having been connected with the sewer, making a total of 1,062. The number of connections made to the boundaries of properties is 400, and I believe this implies the sewerage of about 2,000 houses. Since my last report the removal of nightsoil by your

Council's own officials has had a fair and extended trial, and although the reduction of the large number of arrears existing in the early part of last year was a matter of difficulty, yet, by the end of August there were no arrears, and the work has been done more speedily and thoroughly than ever before. I think it will be conceded that the superiority of the present over the old method of contracting is very manifest, and more than justifies its final adoption.

“While the fixing of water-closets to all new buildings is to be highly commended, I would strongly urge that the work of privy conversion be still prosecuted with vigour, as I am convinced the continued existence of the old system has a most unhappy bearing upon our death-rate.”

In Fenton, it is said that the “conversion of cesspit privies into water-closets is progressing rapidly, there being now about 850 of the latter in use.

In Handsworth, the Medical Officer of Health states that “moveable receptacles are being gradually substituted for the middens, when privy-middens are converted, and are also provided in all newly-built houses.” It appears that during the year “in 330 cases privies and middens were converted into water-closets and dry ash-pits or receptacles, after notice had been served on the owners, in addition to many which were converted, without notice, on the suggestion of Mr. Hodges; an increase of 31 as compared with the year 1899.”

The Medical Officer of Health of Heath Town points out that an improvement is necessary in the method of night-soil removal.

The Medical Officer of Health of Kidsgrove says that the remarks in his previous report with reference to the removal of night-soil and ashes, and the condition of privies generally, still hold good, and on referring to what these remarks were, I find the following statement:—“The night-soil and ashes have not been removed in a satisfactory manner during the year. Much more attention is required in this department. The privies are too often allowed to remain full, and consequently leak into the yards.”

The Medical Officer of Health of Leek states that the question of refuse disposal calls for attention, and recommends the abolition of the "tip" system, and the provision of a destructor.

The Medical Officer of Health of Lichfield writes:— "Although there has been some advance made in the removal of insanitary conditions during the year ended, I would supplement your Inspector's report by again urging upon you the great necessity that exists of a more regular system for the removal, or the more effectively dealing with house and ashpit refuse. Water carriage being the best and most suitable system of disposal, old and foul privies should be abolished, and water-closets of modern construction substituted, and the other sanitary and structural defects mentioned should be forcibly urged upon the attention of property owners with a view to their more prompt correction.

"These matters have been brought under your notice in former reports, and I again press them on your consideration."

In view of a previous statement under the heading of infant mortality, it is to be hoped that the Corporation of Longton will take more vigorous action than appears to be contemplated in the following extract from their Medical Officer of Health's report:—" the Authority is contemplating substituting the modern dust-bin for the unpleasantly odorous ashpit, which takes up space in the small areas at the backs of the houses, and also doing away with the cesspools, either wholesale or at least more rapidly than by the present method, which at the present rate will require about fifteen years to complete the work. If it were not for the existence of these abominable collecting pits we should have less typhoid and other infections, and there would be less expenditure of money per annum, which is also an important matter."

In Newcastle 255 water-closets have been substituted for privies, pails, and cesspools, and in the case of all new houses water-closets or waste water-closets are fixed.

The Medical Officer of Health of Rowley Regis, writes:— "The work of removal has proceeded on the whole satisfac-

torily during the past year. It is a troublesome undertaking, as is the case in all districts with this kind of work. Advantages are accruing in the diminution of the quantity of excreta to be removed by the increased number of water-closets which the Council continue to have substituted for the ordinary midden closets wherever the circumstances render it necessary. No new houses are allowed to be provided with other than water closets. In March last the Sanitary Inspector reported that there were 776 water-closets, 4,089 privies, 3,035 privy-middens, and 440 refuse receptacles in the district."

The Medical Officer of Health of Smethwick writes:—
 "It is satisfactory to be able to record that the days of the privy are over, for since 1895-1896 no more have been built. At the end of the year under notice, however, 3,600 privies and privy-middens still survived. During the last few years the Health Committee have steadily pressed on the process of conversion, and property owners have recognized that it is largely to their interests to make these conversions. In effecting these conversions, the Sanitary Inspector has been most diligent, and it is undoubtedly due to the way in which he has gone about the work that such good results have been arrived at. The number of conversions that have been made since the sewers were completed is shown in the following table, which is re-produced from a report which the Sanitary Inspector has recently presented to the Health Committee:—

	W.C.s PROVIDED.	PRIVIES ABOLISHED.	MIDDENS ABOLISHED.	HOUSES.
1896.....	140	140	126	151
1897.....	226	226	175	240
1898 ...	401	395	276	434
1899.....	509	500	340	569
1900.....	645	621	394	707
TOTALS..	1921	1882	1311	2101

The following remarks, having reference to the causation of diphtheria in the town, are quoted from the report of the Medical Officer of Health of Stoke-on-Trent:—"The comparatively large number of cases occurring in connection with slop-closets is remarkable. I find Dr. Meredith Young drew attention to this in his report of 1899, in the borough of Crewe.

" Some results of examinations by the Sanitary Inspector of streets in which cases of diphtheria occurred are given below :—

" **PARKER'S TERRACE.**—Fourteen houses, all with very large and very offensive cesspits. On examination, ten of these cesspits were found defective, and causing pollution of the soil.

" **PEEL STREET.**—Of 29 houses examined, 21 had leaky cesspits, in six the cesspits were sound, and two had water-closets. In most of these houses the drains were found to be defective.

" **COPELAND STREET.**—Thirteen houses were examined, 11 had leaky cesspits.

" **REGISTRY STREET.**—Fifteen houses were examined, seven had leaky cesspits, one cesspit was sound, and seven had water-closets.

" **PENKHULL TERRACE.**—Four houses were examined, and all the cesspools leaked. In most of the houses in this terrace the rain-water pipes are directly connected with the sewers and drains, and act as ventilators.

" **LOVATT STREET.**—Eight houses were examined, and the eight cesspits were found defective.

" The result of these examinations will give some idea of the amount of ground pollution from leaky cesspits there is in the borough."

In the same report, with reference to the abolition of privies and ash-pits, the following statement appears :—

" Throughout the year, 300 cesspit-closets have been converted into water-closets. It is, however, to be regretted that

in two-thirds of these simply pans have been put in, without a proper flush ; the water for flushing must be carried by hand. Towards the end of the year I drew the attention of the Sanitary Committee to this serious defect, and I venture to hope that in all future alterations a flush-tank will be insisted on.

“ I consider that this conversion of cesspits into water-closets is most important work, but it is being carried out comparatively slowly. There is no comparison, from a sanitary standpoint, between a small yard to a cottage house with a cesspit and a large open ashpit, and one with a water-closet and an ashbin. The alteration is always appreciated by the occupier.

“ Fully three-fourths of the cesspits examined during the year were found to be leaking in the ground. The cesspits in the borough are only emptied on an average five times yearly. There are about 2891 in the town.

“ While the alterations of the cesspits are being carried out, it is usually found easy to have bins substituted for the large uncovered or dilapidated ashpits. There are now 850 ashbins in use in the borough ; these are emptied weekly. There are also about 120 houses and shops in the main streets from which the refuse is removed daily free of charge.

“ Hitherto the Sanitary Inspector has had to supervise the alterations in the construction of the drains, &c., in connection with these conversions. The Committee have now decided that this work is to be passed on to the Borough Surveyor’s Department. By this arrangement the Sanitary Inspector will be able to give the time to other necessary work.

“ In 1897, 40 cesspits were converted into water-closets.
 , , 1898, 161 , ,
 , , 1899, 172 , ,
 , , 1900, 300 , ,

“ It will be seen that a very large amount of sanitary work has been done in this way during the year. In most

instances it has meant the re-draining of the premises. I hope that this work will be carried on with increasing energy."

It is satisfactory to find that the Corporation of Stoke-on-Trent are contemplating the erection of a destructor.

In Tamworth it is said that the work of abolishing the large offensive privy-middens is being proceeded with.

In Tunstall, 120 water-closets have been substituted for the old cesspits.

In Uttoxeter it appears that the Council have taken over the scavenging, which was previously carried out by a contractor, and it is said that the change has proved satisfactory from a sanitary point of view.

In Willenhall, the Medical Officer of Health does not report very favourably on slop water-closets, and says:—"I advise the Council to encourage the use of wash-down in preference to waste-water closets, because experience shows the latter to be far more liable to be blocked by careless and ignorant people. A charge of 10s. per year *per house* for water for each wash-down closet is generally regarded here as excessive—hence the greater use of the waste-water closet. In Walsall I am told there is no charge for water for one closet and only a charge of 4s. a year for each extra closet; whilst in Bilston there is no charge for one closet, and a charge of 7s. 6d. a year for every closet beyond the first. As many water-closets are in use for more than one house, the charge *per house* and not per closet seems to emphasize the contention that the charge here is excessive. Can the Council do anything to get the rates favourably revised, so as to encourage the use of a better type of closet?"

The Medical Officer of Health of Seisdon Rural District writes:—"The adoption of emptying privies by contract, in the Penn Parish has been a great step in the right direction, and should certainly be adopted in the other populous districts, more especially in Kinver and Wombourn, where so many nuisances occur of this nature."

The Medical Officer of Health of Stoke-on-Trent Rural District writes as follows:—"The removal of excreta and ashes is not now carried out by contract, but under the supervision of the Sanitary Inspector. By hiring a man and a cart to do certain districts, instead of as in former years an agreement being made with one farmer for the whole year, it no doubt has been done more effectually; but there have been occasional delinquencies."

The Medical Officer of Health of Walsall Rural District writes:—"Several slop water-closets have been fixed in place of privy cesspits, and have been found very satisfactory. This I am convinced is a move in the right direction, and I hope the number of this class of closet will steadily increase, and so do away with the insanitary and often stinking old-fashioned privy."

In the same report, under the heading of scavenging, the following remarks appear:—"At Rushall and Pelsall the scavenging might be better done, possibly the reason is that a sufficient staff of men and horses are not engaged, but as I stated last year tenants of cottage property are always neglectful in acquainting the contractor when their ash-pits and privies need attention."

The Medical Officer of Health of Wolstanton Rural District writes:—"The removal of night-soil and ashes has only been performed in a fairly satisfactory manner during the year; greater attention on the part of the contractors ought to be paid to prompt removal, and also to the time specified for such removal in their contract."

SEWERAGE AND SEWAGE DISPOSAL.

Apart from the information already in the Council's possession as to the general activity on the part of most Authorities in improving the various sewerage systems, it is evident, from the prominence given to the subject in most of the reports, that honest efforts are being made to meet the views of the Council. The following summary of the remarks under this heading will serve to show that this is the case:—

Under this heading, the Medical Officer of Health of Audley points out that some amount of work has been done during the year, but that in their efforts to provide for the disposal of the sewage in certain parts the Authority are experiencing difficulty in obtaining land for the purpose on satisfactory terms.

The Medical Officer of Health of Cannock Urban District points out that it is highly desirable that the sewerage extension scheme, which has been sanctioned by the Local Government Board, should be carried through.

In Heath Town, it is said that two-thirds of the properties are now connected with the new sewers.

The Medical Officer of Health of Leek Urban District writes:—"The method of sewage disposal has proved with us, as in so many other places, a source of great trouble, and has necessitated the expenditure of a large sum of money without attaining satisfactory results.

"On the south side, a scheme of Mr. Bailey Denton's, consisting of downward filtration and broad irrigation, was adopted in 1899. So far, the results according to the analyses of the effluent by the County Medical Officer, are, to say the least, not encouraging; the lower irrigated portion being frequently in the condition of a swamp; to remedy which additional under drainage is now contemplated.

"On the north side, the old land treatment (broad irrigation) is still in vogue; the Council employs a man constantly to attend to the carriers, &c., with the result that there is no swamp, and no offensive odour.

"Until we have some guidance from the south side experiments, it is difficult to advise any particular scheme for the north, which would involve a further large outlay of money. We await the results from the various 'biological' and other experimental methods now being carried on in various parts of the country to throw more light on this very unsettled, costly, and much-disputed subject."

I would point out, with reference to the last sentence of the above quotation, that the disposal of sewage by biological methods is no longer in the experimental stage, and the District Council of Leek cannot hope to be allowed to further postpone the question on such grounds.

At Quarry Bank it is said that the first section of the sewage scheme, which was sanctioned in 1897, has been completed. In this district, it will be remembered, difficulties were experienced owing to mining subsidences, and the carrying out of the scheme had to be postponed.

In Rowley Regis it is stated that 1,300 houses have been connected with the new sewers during the year, and that only about 250 now remain to be connected. With reference to the question of connecting cellars with the sewers, I quote the following from the report of the Medical Officer of Health :—
“ The question of reverting from our practice of only allowing cellars to be drained into storm-water channels or into private drains not connected with sewerage-carriage has been reopened and the propriety of allowing them to be connected with the sewers discussed.

“ Dr. Geo. Reid, the County Medical Officer of Health for Staffordshire, writes in reply to a communication from me as regards the question of cellar-connections with the sewers :—

“ ‘ 1st. Is it necessary ? Either it is intended for providing an outlet for ground-water which enters cellars, or a means of getting rid of water used in washing cellar floors. In the first case, if a cellar is liable to flood, then it should be abolished as a cellar, or, if possible, the floor should be raised to such a height as to be above the ground-water level. As regards the second use for the drain, it is quite unnecessary, for why should not a cellar floor be cleaned in the same way as a kitchen floor ?

“ ‘ 2nd. The dangers of cellars are obvious. All traps which are not in constant use are liable to become unsealed by evaporation, in which case the occupants of the houses having cellar drains are exposed to great

risks unless conditions are complied with which are hardly practicable in all cases.

“ ‘ 3rd. The conditions referred to are as follows:—

“ (1st) Either the cellar connections must be carried through the wall on to a trapped gully in an area, a condition which it is impossible to comply with in country towns, or (2nd) every cellar connection must be disconnected in the following manner:—First the waste should be trapped and carried through the wall into a shaft constructed say of 6in. pipes terminating above at the ground-line where it should be covered by an iron grating, and below being connected with a 4in. gully trap, over which the drainage from the cellar falls. This at best is a poor expedient, still it does provide some amount of disconnection, and to a certain extent limits the risk.

“ ‘ Provided the work of house connection is carried out by the Authority, does not this open up a very large question, and expose the Authority to actions for damages in the event of disease being traceable to insanitary work ? ’

“ I congratulate the Council on adhering to the old rule of not allowing cellar connections except in exceptional cases, all of which are to be brought directly to their notice.”

The Medical Officer of Health of Sedgley writes as follows under this heading:—“ Steps have just been taken by this Council to have the opinion of an expert on this matter. The question is one of great difficulty, partly because of the physical features of the district (which will probably necessitate several outfalls), and also because of mining operations in process, and in immediate contemplation, which would wreck any sewerage works and load the district with a ruinous expense. It is, however, fortunate that the question has been delayed so long, because recently much advance has taken place in the disposal of sewage by biological processes, and at much less expense than formerly.”

The Medical Officer of Health of Short Heath writes :—
 “ With reference to the provision of sewers I wrote in 1893 advising the Council to consider whether the time had not arrived for a better and more extensive system of sewerage, discharging on lines parallel with the Bentley Brook course, on to properly-constructed filter beds near the Gas Works ; and whether it ought not to secure the land whilst it is to be had, first submitting the question to a competent surveyor and deciding on the system of filtration suitable to render the effluent harmless. This matter still needs the attention of the Council.”

The following paragraph, which appears in the report of the Medical Officer of Health of the Borough of Stoke-on-Trent, should not be overlooked, and it is desirable that the work, in place of being done when some special defect is noted should be carried out systematically throughout the town :—
 “ In very many parts of the district, the rainwater fall pipes are connected direct with the drains and sewers, and act as ventilators. Many of these have defective joints ; an effort should be made to disconnect these without delay. At present, they are only dealt with when specially defective. In all new houses they are disconnected.”

In Tamworth, from the Medical Officer of Health’s description of the condition of the existing sewers, it is evident that the need for a scheme of sewerage is very pressing, from a health point of view, apart from the question of rivers pollution. It is important, therefore, that no time should be lost in preparing plans for the approval of the Local Government Board.

In Wednesfield it is said that the new scheme has, so far, proved satisfactory, and up to the present time 310 houses have been connected with the new sewers.

The Kingswinford Rural District Council, it is said, have obtained an order enabling them to purchase land, and plans of a sewage disposal scheme are now being prepared.

As regards the Tamworth Rural District, it appears that a comprehensive scheme is now under consideration, which

will provide for several districts jointly with the Borough of Tamworth.

The following remarks, under the heading of diphtheria, in the report of the Medical Officer of Health of Tutbury Rural District, should spur on his Authority to carry through, without any further delay, the various schemes of sewerage which are so much wanted, particularly at Tutbury, Rolleston, and Barton-under-Needwood :—“ In many parts of the district (notably in Tutbury) the very unsatisfactory condition of the sewers has been undoubtedly the origin of infection, sewage gas freely escaping from defective drains.”

WATER-SUPPLY.

The following is a summary of the remarks with reference to water-supply in those districts where the subject receives most notice in the reports. The Sanitary Committee of the County Council have frequently had occasion to spur on authorities in districts where good public supplies are available, but where many old local wells, liable to pollution, were still in use.

In Brierley Hill, 2,035 houses, out of a total of 2,425 in the district, are supplied with water from the mains of the South Staffordshire Water Works Company. Those not so supplied are dependent upon local surface wells, the water from which is generally found to be unwholesome upon analysis. Out of eight samples which were analysed during the year, all were condemned.

The Medical Officer of Health of Brownhills writes :—“ I am glad that the public water has been, in a great number of cases, made use of. Still, much remains to be done, and I would strongly urge the policy of ‘ no mercy ’ when existing wells are found deficient. Few, indeed, of the wells are really good, most of them tapping only the surface measures, and they are thus easily open to surface contamination. You will notice that few get a good report from your Analyst. They are just removed from the pale of coercion to provide a better supply. I should be really glad if in some cases legal action were taken. This would greatly strengthen our hands.”

The Medical Officer of Health of Quarry Bank says :—“ The extension of the South Staffordshire Water Works Company’s mains to Dunn’s Bank and Level Woods in the early part of the year has met an old-standing grievance. Ravensitch and Mearce Coppice are still without a proper supply.”

The Medical Officer of Health of Rowley Regis writes under this heading as follows :—“ During the year samples of water from 60 wells have been submitted to the County Analyst for examination. Fifty-six of these wells suplying 118 houses were found to be contaminated and unfit for use. The South Staffordshire Water Works Company’s water has been ordered and laid on in each case with the exception of two or three which are not yet completed. During the last five years 300 wells have been condemned, and there still remain about 200 more to be examined. There still exists a strong prejudice amongst many of the people against substituting the South Staffordshire Water Works Company’s water for well-water, even when the latter has been declared by the County Analyst to be unsafe for drinking.

“ One reason for objection is always brought forward, viz. :—that the Water Works Company give an intermittent supply. I must say there is some cause for his complaint, and it is a frequent source of annoyance to consumers, but it is absolute nonsense for them to suppose their polluted wells should be retained as a source of water-supply because they are without the Company’s water for a few hours or even a day at a time. Another matter in connection with the water-supply is of importance, and that is, people should not be allowed to discontinue the Water Works Company’s water and again revert to their old wells which have been condemned. I fear this practice is, and will be, carried on until all wells are filled up after being proved unsafe.”

The Medical Officer of Health of Rugeley writes :—“ The supply of water from the Artesian Well on Cannock Chase continues ample and good. Thirty-four new house connec-

tions have put in during the year, but there are still 134 houses which draw their water-supply from wells. I examined specimens of water taken from these wells, which I found to be more or less impure, and advised your Council to have a full analysis made of two of them, but have not yet received authority to have this done."

As regards Sedgley, it is satisfactory to find that a public supply will soon be available for Cinderhill, but as regards Gibbon's Hill, the Medical Officer of Health writes :—" The South Staffordshire Water Works Company originally had the right to supply, but transferred that right to the Wolverhampton Corporation, the limit of whose water area is the top of Gibbon's Hill. This Council has offered the Wolverhampton Corporation to give the 10 per cent. guarantee provided for in Section 35 of Water Works Clauses Act, 1847, if the Corporation will arrange with the South Staffordshire Water Works Company to extend their mains into the small portion of the Wolverhampton area under consideration. A physical difficulty exists because this portion is beyond the present pumping power of the Corporation, and their nearest water main is about $1\frac{1}{4}$ miles away, whereas the South Staffordshire main is quite near. It is to be hoped that the Corporation will carry out this Council's suggestion, and thus develop a portion of our district close to their border and helpful to their interests."

As regards the general question of water-supplies the following remarks also appear in the same report :—" The whole question of water-supply seems to be founded on a wrong basis. Pure water is as absolutely essential to good health as pure air, and is a universal necessity. Water companies exist for commercial and not health or philanthropic purposes and thus it often happens that the public wants and public health suffer. There seems no reason why Great Britain should not imitate some other countries where the Government are the direct authorities in the matter, and supply the communities."

At Short Heath it is said that the water-supply is now abundant and that it is supplied to all the houses with 39 exceptions.

In Smethwick local wells have gradually been abolished until now only 80 remain, supplying about 207 houses.

In Stone Urban District it is said that the public supply continues good and plentiful, but that there are still many shallow wells in the town, the water from which is suspicious, if not absolutely impure.

The following extract from the report of the Medical Officer of Health of Tettenhall shows how futile an attempt to cleanse existing wells frequently is :—“ Five years ago the water in a well in New Village was condemned. It was found that a faulty drain percolated into the well. The drain was relaid and the well cleaned out. The same well during 1900 gave rise to three cases of typhoid. It is now closed and tap water laid on to the houses.”

The Medical Officer of Health of Tipton writes :—“ During the year 178 houses, out of a total of 6,647 houses, have had this supply laid on to them, making a total of 6,392 houses in the parish at present receiving it.

“ Our well-water is invariably found to be full of sewage matter when it is analysed. During the year I have analysed seven samples of well-water; all were sewage contaminated. I have never yet found any to be fit for drinking purposes; the broken state of the ground allows of free percolation, and, as much of our drainage is surface-drainage, there is nothing to prevent free soakage into the ground.”

The Medical Officer of Health of Wednesfield writes :—“ I would again urge upon the Council the desirability of providing the inhabitants of The Scotlands with good potable water, as the present supply is inadequate and irregular, and not devoid of absolute danger to those who are compelled to drink it.”

The following quotation from the report of the Medical Officer of Health of Cannock Rural District indicates that the

Authority have made considerable progress in improving the water-supplies in different parts of the district:—"An agreement has been entered into with the South Staffordshire Water Works Company for supplying water to Great Wyrley. The Council have adopted a scheme for the supply of water to Cheslyn Hay, the estimated cost of which is £5,000; application has been made to the Local Government Board to sanction a loan." It is also stated that an expert has been employed to report upon the water-supply of Wheaton Aston.

The Medical Officer of Health of Cheadle Rural District states that Lightwood has been connected with the town supply, and that substantial progress is being made in providing an improved supply for Kingsley.

The Medical Officer of Health of the Eccleshall Division of the Stone Rural District states that the supply at Shallowford is still far from satisfactory.

In the Gnosall Rural District, where the question of the water-supply of the village of Gnosall has been the subject of frequent communications between the Sanitary Committee of the County Council and the District Council, the position is still highly unsatisfactory, as appears from the following extract from the report of the Medical Officer of Health:—"Among the samples of water condemned as unfit for use are those from the three public wells in Gnosall, from which a number of the inhabitants obtain their only water-supply. As I have already pointed out in previous reports, this is a standing danger to the public health, as though the use of such water does not of itself produce epidemic disease, it is well known that when some of these diseases are once introduced the use of a defective and easily polluted water-supply is the readiest method by which an epidemic spreads."

The Medical Officer of Health of Kingswinford Rural District writes:—"I have examined seven samples of water. In five cases the water was impure and unfit for human use, and in two cases it was usable. In all these cases, however, tap-water has been laid on.

"The water-supply to Wall Heath is still in a deplorable condition, the inhabitants having to use rain-water collected in cisterns. A considerable number have not even this supply, and have to borrow from their neighbours. I must again urge upon you the necessity for having this condition of affairs rectified by bringing all the pressure you can upon the South Staffordshire Water Company to compel them to lay down mains for this part of the district."

In Newcastle Rural District the question of providing Leycett and Keele with better supplies is being considered by the Authority. The Medical Officer of Health states:—"At Betley one new well was sunk, but the water-supply here is still insufficient."

The following extract from the report of the Medical Officer of Health of Seisdon Rural District indicates a serious state of affairs in some portions of that district as regards water-supply:—"Tap-water has been supplied to 16 houses, principally in Penn. Twenty-five samples of water have been analysed, of which 14 have been found polluted. Out of 17 samples from the neighbourhood of Smestow, only 7 were passed, and they were questionable, so that it is absolutely necessary for pure water to be supplied at once. In Kinver, the inhabitants dare not use their own wells in numerous cases, and when their neighbours' water, which they do use, is analysed, it is generally proved to be polluted."

The Medical Officer of Health of Stone Rural District writes:—"Negotiations are still going on with the Stone Urban District Council for the supply of Oulton with water, and which I hope your Council will be able to bring to a successful issue. At Hanford, water has been laid on from the North Staffordshire Waterworks Co. to several houses where the water supplied from shallow wells was found to be bad. At Rough Close the difficulty still remains. A special report on this subject was brought before your Authority by the Medical Officer of the County Council. A good deal of building land would come into the market, and houses be erected

here if the initial obstacle of a plentiful water-supply could be overcome."

The Medical Officer of Health of Tutbury Rural District states that the water-supply at Hanbury is still unsatisfactory, and that it has become a serious question, the solution of which presents much difficulty. As regards the town of Tutbury, the following extract from his report should receive the immediate attention of the Authority:—"Some time ago I sent your Council a report on the water-supply of Tutbury. It is derived from—

- No. 1 The Town Pump.
- „ 2 The Ludgate Street Pump.
- „ 3 Numerous Private Wells.

"The Town Pump which formerly was found to contain organic impurities, may now be considered satisfactory both as regards quality and quantity. The tank which, until recently, was underneath the road in Cornmill Lane, has now been removed to the side of the hill and is very well protected.

"The Ludgate Street Pump also affords a good supply of water, and is sufficient for the wants of that part of the town.

"A large proportion of the private wells are hopelessly contaminated, the surroundings in many cases being extremely bad, consisting of leaky drains, filthy ashpits and closets, and the ground is so saturated with organic matter that it is almost impossible to prevent contamination. I should strongly recommend you to close up all wells which on analysis are found to show signs of pollution, as in my opinion it is not worth the trouble and expense to clean them out, as in many cases in which this was done (notably in that of the soup kitchen), the subsequent analysis shewed little, if any, improvement. I believe a good supply may be obtained from Conduit Meadow which would be sufficient for the wants of Duke Street and the immediate neighbourhood. The town pump, as I said, would supply the lower part of High Street and the vicinity, and I would suggest the sinking of a well somewhere at the top of Burton Street for the supply of that part of the town. Finally I would recommend your Council to seek the advice of a competent water engineer on the whole subject."

The Medical Officer of Health of the Uttoxeter Rural District intimates that an improved supply has been provided for Draycott-in-the-Clay, and he expresses the hope that the Council will take up the matter of the supply of Abbots Bromley, so that a village of that importance shall not be dependent upon the present dangerous and inadequate supply.*

SLAUGHTER-HOUSES AND MEAT INSPECTION.

Most of the reports refer to the inspection of slaughter-houses, and, as a rule, they are said to be found in a fairly satisfactory state.

The Medical Officer of Health of Brierley Hill writes:—“The slaughter-houses, attached as they are to the butchers' premises, are a great source of nuisance. I condemned one of them last year, but it is still being used. Generally they comply with the bye-laws as to lime-washing, drainage, etc. It is in the disposal of the offal, and the nuisance which is created by its removal, that most complaint arises. In this respect the bye-law with regard to frequency of removal and cleanliness is practically a dead letter. The butcher removes the nuisance when it is convenient to himself, which is generally when it is very stale.”

Later, in the same report, the Medical Officer of Health states that a public slaughter-house is one of the requirements of the district which has often been mentioned and informally discussed.

The Medical Officer of Health of the borough of Newcastle writes regarding slaughter-houses as follows:—“These are practically in the same condition as set forth in detail in my previous reports, except that they are inspected oftener and are consequently kept in a cleaner condition.

“Copies of the bye-laws are posted in each slaughter-house, and notices required have been placed on the doors in accordance with the requirements of Section 170 of P.H. Act, 1875.

* Since this report was prepared by the late Medical Officer of Health, I regret to say the Authority have come to the conclusion that an improved supply for this village is not necessary.

“ The same objections as to the unsuitability and situation of certain of the buildings still holds good, and a much-to-be-desired improvement would be the abolition of all the present slaughter-houses and the erection of a public slaughter-house or abattoir in a suitable position and under the control of the corporation. By this means the nuisance arising from slaughter-houses scattered all over the town, some in most unsuitable places, would be done away with; and, moreover, an efficient and systematic inspection of all the meat could be easily and effectively carried out—a thing greatly to be desired.”

The following account of the condition of the slaughter-houses at Stoke-on-Trent speaks for itself, particularly that portion of it which is printed in *italics*, although in the original I must point out this was not the case:—“ The slaughter-houses have been frequently visited during the year. In many, the lairs intended for the accommodation of animals for slaughter are also used as stables—horse, harness, and cart being kept in the lairs and slaughter-house. This use as stables leads to accumulation of manure in large heaps, and these are in some instances left for weeks on the premises. It also diminishes the accommodation available for animals intended for slaughter, so that in one instance pigs had to be kept on the manure heap.

“ In one case the slaughter-house was used as harness-room and place of deposit for everything in general. In another instance it was used as the wash-house. These premises are registered or licensed as slaughter-houses, and should be used solely as such. In few instances were proper receptacles provided for deposit and removal of offal and garbage, so that it was impossible to cleanse them. In many the paving was very defective.

“ In several cases pigs were kept on the premises constantly, and in anything but a cleanly state. In one instance the manure heap, situated a few feet from the slaughter-house door, received the manure from neighbouring stables and offal and garbage from the slaughter-house. Early in the year an

application was made for the renewal of a license for certain premises; *they were in such a state that I felt it my duty to support the request of the Sanitary Inspector that the license should be refused. It was, however, granted.*

“The bye-laws were printed by order of your committee, and each occupier had two copies, one suitable for hanging in the slaughter-house.

“An effort has been made to have the manure moved more frequently, and in one instance the heap has been done away with. In several instances better receptacles have been provided and other suggestions carried out, but much remains to be done.”

BAKEHOUSES.

Most of the reports mention the fact that the bakehouses are regularly inspected, but few contain any observations under this heading which call for special notice.

DAIRIES, COWSHEDS, AND MILKSHOPS.

The work under the Dairies, Cowsheds, and Milkshops Order receives attention in most of the reports.

The Medical Officer of Health of Biddulph writes as follows:—“During the summer months systematic inspections were made by the Medical Officer of Health and Inspector, and almost the whole district was covered (see Table V.) Several peculiar features were observed, which have not presented themselves in any of my other districts. There are, especially on Biddulph Moor and throughout the north-eastern part of the district, a large number of scattered cottages, each having a small cowshed, frequently part of the same building, and an adjacent pigsty. One cow is kept, and the milk produced is first used to make butter and afterwards to feed the pig. As no milk is supplied for human consumption, it is doubtful how far these persons and premises come under the provisions of the Dairies Order. Until this point is settled by authority, I refrain from advising any action by the Council in these cases, although in most of them the cowsheds (often substantially built of stone) are entirely without light, ventila-

tion, or drainage, and in many instances were in a very dirty condition. The number of farms maintaining larger or smaller herds of cattle, whose tenants are purveyors of milk, is comparatively small. These will shortly be visited and inspected again, together with the remaining premises on the westerly side of the district which were not included in the previous round."

The Medical Officer of Health of Burton-on-Trent again devotes considerable space to this question, and from his report I quote the following:—"I have no reason to think that the conditions under which milk is collected are any worse in Burton than in most places, and therefore no remarks I may have to make should be construed as implying such. There is no doubt, however, that dairymen generally attach far too little importance to the sanitary aspects of cow-keeping and milk production. In this respect public opinion itself needs education. That disease and death can readily be, and not infrequently are, carried through the medium of milk, admits of no possible doubt."

The Medical Officer of Health of Brierley Hill writes:—"There are no dairies in the proper sense of the word. Milk is brought in large urns from the country, but no provision is made for storing cans and cleansing them other than will be found at any ordinary working man's house. The cowkeepers do not make any special provision, using their wash-houses, and in some cases the cellars, in which to keep and wash the cans. In one case in which the cellar was used I found a drain communicating with the sewer. I am satisfied that the class of cowkeepers in this district, with one or two exceptions, have a very hazy idea of the importance of making separate provision for storing the milk and pails. With regard to the cowsheds, from what I have seen, the regulations might as well have never been issued. There are two only that I can conscientiously report as being well kept and clean; but even those are open to improvement as to ventilation, drainage, and storing of manure. The system under which cowkeeping exists is not likely to ensure good sanitation. Any working man who

can afford it thinks he knows how to keep cows—he goes on with his usual work and the wife looks after the cows; the consequence is, they very rarely get groomed, and you find their hind quarters plastered all over with manure, and slop and filth lying all about the place. At some of the cowsheds I have found the place, at almost tropical heat, with slop and filth lying about, the cowkeeper protesting that the heat and the smell were both good for the cattle. Of course this means so much ignorance and laziness, which should be sharply looked after. A visit once a quarter evidently does no good, and some better and more strict supervision, new bye-laws, or more stringent regulations, is urgently needed."

The Medical Officer of Health of Rowley Regis writes:—“No plans for the above-mentioned buildings are passed unless they comply with modern requirements in every detail. Improvements are being carried out, rather slowly but steadily, with many of the old ones, and greater efforts will be made in this direction during the present year. On the whole they are fairly well kept. Some of the old ones have been abandoned and new ones substituted. I regret that we have not a Veterinary Surgeon as Inspector of milking cows. There are about three hundred cows kept for milking in the parish, and I think it would be a step in the right direction if the County Council would afford the same facilities for periodical bacteriological examination of milk as it does for the diagnosis of diphtheria, etc.”

From the following quotation which appears in the report of the Medical Officer of Health of the Borough of Stoke-on-Trent, it would appear that the dairies and cowsheds cannot be reported upon more favourably than the slaughter-houses in that district:—“In the early part of the year I made a special inspection, with the Sanitary Inspector, of dairies and cowsheds, and found that the regulations in force in the Borough with respect to cowsheds were not being complied with.

“In nearly every instance the cowsheds were overcrowded. In some instances as little as 350 cubic feet only being allowed for each cow. The ventilation of the sheds was, in most cases,

not attended to in the slightest degree. In some it was necessary to open the doors for a few minutes before going in, on account of the oppressive smell and moisture-laden air; in some there was no means of ventilation. The fodder was frequently stored in the shed, or in a loft above in direct aerial communication with it.

“In most sheds the lighting was very deficient. In some there was no means of admitting light other than by the open door. In few was there any attempt at keeping the floors or walls clean, and in some cases they were filthy. The hind-quarters of the cows were in a similar condition. In one instance the Sanitary Inspector refused to recognise the erection as a cowshed, the conditions were so bad.

“In some instances drainage of the sheds was very defective, or absent altogether, and immense accumulations of manure were within a few feet of the doors.

“It is satisfactory to note that in a few cases some of the defects were remedied, but little or nothing was done in the worst instances, even after repeated efforts.

“On being reported to your Committee, they judged it best to rescind the regulations in force in the borough, and adopt the model ones of the Local Government Board—these had only recently been published. They came into force in the borough in the beginning of November.”

CANAL BOATS.

In a few instances only does the question of canal-boat inspection receive notice in the reports under review, and in none of these are there any remarks which call for special attention.

LODGING-HOUSES.

There are no remarks in any of the reports under this heading which call for comment.

FACTORIES AND WORKSHOPS.

The reports under review do not, with very few exceptions, devote any attention to the work of factory and workshop

inspection, and in none are there any remarks which call for special notice.

MORTUARIES.

The question of providing mortuaries does not appear to receive that attention in the reports which its importance deserves.

SMOKE NUISANCES.

Notwithstanding the field there is in this County for action under the smoke nuisance clause of the Public Health Act, the question receives very little mention in any of the reports under review.

BYE-LAWS, &c.

The Medical Officer of Health of Bilston points out that new bye-laws were approved by the Local Government Board last year, and that the erection of new buildings is now under the supervision of the Surveyor.

The Medical Officer of Health of Sedgley writes:—
“ During the year this Council has adopted and printed bye-laws with respect to slaughter-houses, and regulations as to dairies, cowsheds, and milk shops.

“ Regulations with respect to the paving of yards and open spaces in connection with dwelling houses have been drafted by this Council and submitted to the Local Government Board.

“ These measures cannot fail to be helpful in promoting the health of your district, and your bye-laws now about to be drawn up will have the same effect.”

The Medical Officer of Health of Smethwick writes:—
“ As regards dairies and cowsheds new and improved regulations, in accordance with the requirements of the Local Government Board, have been the subject of the careful consideration of the Health Committee, with the view to the adoption next year of statutory regulations, by means of which great improvements will undoubtedly ensue.”

In Willenhall, “ Bye-laws relating to dairies and cowsheds, common lodging-houses, slaughter-houses, streets and buildings have been sanctioned by the Local Government Board. Those

relating to dairies and cowsheds have been printed, and the others are about to be. Other Bye-laws are still under consideration by the Board."

The Medical Officer of Health of Tutbury Rural District says:—"I congratulate your Council on having the building Bye-laws in force; they have finally stopped the erection of houses without proper means of drainage.

"The new slaughter-houses Bye-laws will be a great benefit in those Parishes to which they refer."

ADOPTIVE ACTS.

The Medical Officer of Health of Short Heath again advises the adoption of the Infectious Diseases (Prevention) Act, 1890.

ARSENIC IN BEER.

In many of the reports reference is made to the outbreak of arsenical poisoning which occurred in several of the districts in the Autumn of the year, owing to contaminated beer, but as this was the subject of a detailed report to the County Council, and as the matter is now one of past history and the trouble is not likely to recur, the question need not again be opened.

NOTE.—In the following tables the individual zymotic mortality is given in order to indicate readily the class of disease that has mostly contributed to the gross rate. Apart from this, no accurate deductions can be drawn from such figures for one year only.

URBAN.

Table showing Population, Number of Persons per Acre, Birth and Death-rates, as well as the Death-rates at all ages and among Children under 1 year, and the Death-rates from Zymotic Diseases, Phthisis, and Diseases of the Respiratory Organs.

DISTRICT.	Population at all ages.	Individual zymotic mortality per 1000 of population.										Percentage corrections on basis of 1901 Census.		
		Fever.					Diseases of Respiratory Organs.					Organ.	+ -	
		Measles.		Whooping Cough.		Phthisis.	Diarrhoea and Dysentery.		Continued.		Phthisis.			
AMBLECOTE.....	2876	3420	3128	5·1	20·4	12·8	185	2·92	..	0·58	..	1·46	0·58	2·33 10·1 ..
AUDLEY.....	12631	13000	13679	1·6	35·7	16·2	161	1·07	..	0·07	0·23	0·38	..	0·30 0·46 3·15 .. 4·3
BIDDULPH.....	5230	5350	6247	1·1	34·6	19·1	169	1·17	..	..	..	..	1·17	0·33 3·86 .. 3·6
BILSTON.....	23453	24500	24034	13·1	36·4	22·7	221	3·67	..	0·16	0·36	1·42	0·32	1·22 0·77 4·97 17 ..
BRIERLEY HILL....	11847	12250	12040	12·0	35·9	20·8	159	3·02	..	0·24	..	0·89	0·97	0·08 .. 0·81 0·32 5·71 1·9 ..
BROWNHILLS.....	11820	13031	13252	1·4	45·5	22·7	190	3·76	..	0·38	..	1·22	1·15	0·07 .. 0·92 0·38 4·98 .. 12·8
BURSLEM.....	31999	40868	38766	15·8	36·2	25·7	230	5·40	..	0·44	2·56	0·85	0·44	.. 0·24 .. 0·85 1·12 4·42 7·0 ..
BURTON-ON-TRENT..	46047	53350	50386	13·2	26·0	17·3	143	3·07	..	..	1·23	0·84	0·24	.. 0·05 0·01 0·67 1·59 2·75 6·9 ..
CANNOCK.....	20613	23000	23992	2·8	38·5	17·8	145	2·91	..	0·17	..	1·26	0·13	.. 0·39 .. 0·95 0·52 3·60 .. 3·3
COSELEY.....	21899	22000	22218	5·5	35·3	21·3	175	2·77	..	0·04	0·13	1·40	0·22	.. 0·18 .. 0·77 1·00 3·95 .. 0·9 ..
DARLASTON.....	14422	15628	15591	19·0	38·1	24·2	221	4·28	..	0·57	0·06	1·40	0·12	.. 0·25 .. 1·85 1·27 4·09 2·0 ..
FENTON.....	16998	23000	22742	14·3	42·6	20·5	162	3·39	..	0·47	0·74	0·65	0·21	.. 0·34 .. 0·95 1·00 3·13 3·4 ..

URBAN.

Deaths occurring during the year 1900, classified according to Diseases, Ages, and Localities, together with Births registered during the year.

DISTRICT.	Deaths from all causes at subjoined ages.		Deaths from subjoined causes.																								
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.	Smallpox.	Scarlatina.	Diaphtheria and Members of Groups.	Typhus.	Continued Fevers.	Cholera.	Bryspelas.	Measles.	Whooping Cough.	Diarrhoea and Dysentery.	Bronchitis, & Pneumonia, & Pleurisy.	Heart Disease.	Injuries.	All other Diseases.							
AMBLECOTE	70	44	13	7	2	1	10	11	..	2	..	..	..	..	3	5	2	8	..	..	24						
AUDLEY	465	211	75	25	10	8	50	43	..	1	3	..	..	..	1	5	4	6	41	9	4	135					
BIDDULPH	206	114	35	6	6	4	35	28	..	1	..	..	..	..	..	..	..	..	6	2	23	11	5	66			
BILSTON	892	557	198	121	14	18	110	96	..	4	9	..	4	..	1	..	1	35	8	30	19	122	26	28	270		
BRIERLEY HILL	440	255	70	53	4	4	60	64	..	3	..	..	1	..	..	2	..	..	11	12	10	4	70	14	8	120	
BROWNHILLS	593	297	113	51	12	26	69	26	..	5	..	..	1	..	..	..	..	..	16	15	12	5	65	21	10	147	
BURSLEM	1481	1054	341	235	68	29	286	95	..	18	105	..	10	..	..	1	..	..	1	35	18	35	46	181	49	24	531
BURTON-ON-TRENT	1390	927	199	142	52	40	328	166	..	..	66	..	3	1	..	5	..	..	6	45	13	36	85	147	61	33	426
CANNOCK	886	410	129	52	17	23	110	79	..	4	..	..	9	..	..	2	..	..	2	29	3	22	12	83	14	16	214
COSELEY	777	469	136	83	13	12	123	102	..	1	3	..	4	..	..	2	..	..	5	31	5	17	22	87	26	10	256
DARLASTON	597	379	132	61	18	7	102	59	..	9	1	..	4	..	..	..	..	..	22	2	29	20	64	19	10	199	
FENTON	980	473	159	88	33	21	116	56	..	11	17	..	8	..	..	3	..	..	1	15	5	22	23	72	33	12	251

URBAN—continued.

URBAN—continued.

DISTRICT.	Deaths from all causes at subjoined ages.		Deaths from subjoined causes.																						
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 65.	65 and upwards.	Smallpox.	Scarlatina.	Diphtheria and Membranous Croup.	Typhus.	Puerperal.	Cholera.	Measles.	Whooping Cough.	Dysentery.	Diarrhoea and Enteritis.	Bronchitis, Pneu- monia, & Pleurisy.	Heart Disease.	Injuries.	All other Diseases.					
HANDSWORTH	1275	179	58	15	24	210	146	..	7	2	..	2	..	1	7	21	35	42	99	55	17	341			
HEATH TOWN	364	167	55	23	4	12	44	29	..	1	..	7	..	..	..	12	3	13	8	46	10	10	57		
KIDSGROVE	150	82	25	11	2	3	27	14	..	1	..	2	..	..	..	1	2	10	8	4	53				
LEEK	414	260	62	23	6	18	78	73	..	2	4	..	3	..	1	..	..	2	18	34	15	10	170		
LICHFIELD	216	170	34	18	7	8	63	40	..	1	..	1	..	..	..	2	11	3	15	27	7	5	98		
LONGTON	1392	977	356	172	40	27	295	87	..	14	12	..	14	..	2	..	1	105	..	69	52	117	52	34	505
NEWCASTLE	654	385	134	55	10	8	117	61	..	6	15	..	3	..	1	..	15	4	22	15	74	18	5	207	
PERRY BARR	73	40	13	8	2	1	4	12	..	3	..	..	..	..	..	..	1	3	2	..	7	1	2	21	
QUARRY BANK	255	133	35	24	2	3	41	28	..	..	..	..	..	..	..	..	1	6	6	4	14	22	4	6	70
ROWLEY REGIS	1402	668	249	121	14	24	130	130	..	2	6	..	6	..	4	..	5	47	4	16	18	107	27	22	404
RUGELEY	122	65	13	5	3	1	22	21	..	..	..	..	..	..	..	..	..	4	..	4	10	11	2	34	
SEDGLEY	616	292	87	47	9	8	76	65	..	3	7	..	3	..	..	..	..	26	8	19	6	33	25	3	159
SHORT HEATH	130	72	15	22	6	2	13	14	..	1	2	..	..	..	..	..	..	..	..	..	3	11	2	39	
SMLLTHORNE	264	135	47	27	9	7	37	8	..	4	3	..	..	..	..	..	..	..	..	5	..	4	7	46	
SMETHWICK	1859	872	304	134	40	39	227	128	..	3	9	..	8	..	..	..	3	16	8	42	186	50	31	474	

URBAN—continued.

DISTRICT.	Population at all ages.	Individual zymotic mortality per 1000 of population.												
		Censuses, 1891.			Censuses, 1901.			Estimated to 1900.			Number of persons per acre.			
General mortality per 1000 of population.		General mortality per 1000 of children under one year per 1000.		Mortality in children under one year per 1000.		General mortality per 1000 of population.		Mortality per 1000 of children under one year per 1000.		General mortality per 1000 of population.		Mortality per 1000 of children under one year per 1000.		
STAFFORD	18732	*19340	20·6	25·9	17·5	147	2·44	..	0·86	0·91	0·47	..	..	..
STOKE-ON-TRENT	24027	29439	30456	15·6	33·1	18·4	164	2·54	..	0·20	0·44	0·13	..	..
STONE	5754	6230	5680	5·8	25·3	19·1	145	2·72	..	..	1·76	0·64	..	..
TAMWORTH	6614	7496	7271	26·3	27·3	16·6	117	0·80	..	..	0·13	0·40	..	..
TETTENHALL	5145	5720	5337	4·6	23·4	11·8	134	0·34	..	..	..	0·17	..	..
TIPTON	29314	31000	30543	11·4	34·8	20·2	167	5·06	..	0·09	0·29	1·53	0·38	..
TUNSTALL	17112	18516	19492	18·2	42·9	29·3	241	4·69	..	0·70	2·26	0·70	0·21	..
UTTOXETER	4418	5100	5133	5·2	28·6	17·0	89	1·37	..	..	0·58	0·39	..	..
WEDNESBURY	25347	26000	26544	12·2	35·5	20·2	174	4·53	..	0·23	0·07	2·26	0·03	..
WEDNESFIELD	4328	5200	4883	2·5	27·5	13·2	146	0·77	..	..	0·38	..	..	..
WILLENHALL	16852	19571	18513	15·4	35·6	18·2	169	1·27	..	0·15	0·10	0·46	..	..
Totals and Averages	599476	700481	695786	7·6	33·9	19·3	176	3·04	..	0·18	0·52	0·35	0·29	..
33 large towns in England, average	..	351827	33·8	29·4	19·5	172	2·50	0·00	0·13	0·35	0·43	0·45	..	..
											0·20	..	0·20	..
											0·17	..	0·90	0·98
											..	..	0·94	..
											..	..	0·94	..
											..	..	0·94	..

* The total estimated population is 22427, but a deduction of 1554 has been made, that being the estimated number of persons in Public Institutions within the borough, but not belonging to it.

† Excluding Public Institutions.

§ Not given in Registrar General's Returns.

Continued.

Individual zymotic mortality per 1000 of population.

Percentage corrections on basis of 1901 Census.

Diseases of Respiratory Organs.

Phthisis.

Diphtheria and Dysestheria.

Typhus.

Typhoid.

Whooping Cough.

Measles.

Scarlatina.

Smallpox.

Thrush.

Diarrhoea and Dysentery.

Phthisis.

Diphtheria and Dysestheria.

Phthisis.

Diphtheria and Dysestheria.

Phthisis.

Diphtheria and Dysestheria.

Phthisis.

URBAN—continued.

DISTRICT.	Deaths from all causes at subjoined ages.		Deaths from subjoined causes.		Deaths from all causes at subjoined ages.																		
	Under 1 year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under 55.	65 and upwards.	Deaths from all causes.	Deaths from all causes.	Deaths from all causes.	Deaths from all causes.	Deaths from all causes.	All other Diseases.											
Registered Births.	Deaths from all causes.	Deaths from all causes.	Smallpox.	Scarlatina.	Diphtheria and membranous croup.	Typhus.	Enteric or typhoid.	Contagious.	Relapsing.	Puerperal.	Cholera.	Measles.	Whooping cough.	Diphtheria and dysentery.	Bronchitis, phrenitis.	Monochitis, phrenitis.	Heart Disease.	Injuries.	All other Diseases.				
STAFFORD.....	541	366	80	52	22	12	109	91	..	18	..	1	..	1	19	10	4	28	63	39	5	178	
STOKE-ON-TRENT.....	977	544	161	70	30	26	149	108	..	6	25	..	2	..	3	13	4	22	31	96	38	14	285
STONE.....	158	119	23	16	8	8	27	37	..	..	1	..	..	..	..	11	4	1	5	17	10	4	66
STAMWORTH.....	205	125	24	9	5	5	46	36	..	..	1	..	..	..	..	1	3	..	2	7	26	14	2
TEFFENHALL.....	134	68	18	5	1	3	18	23	..	..	..	..	..	..	..	1	1	2	14	6	2	14	42
TIPTON.....	1081	628	181	128	17	21	170	111	..	3	9	..	12	..	3	..	..	48	12	73	17	100	300
TUNSTALL.....	795	544	192	141	26	19	166	..	..	13	42	..	1	..	2	..	..	13	4	14	30	113	35
UTTOXETER.....	146	87	13	12	3	2	38	19	..	..	..	..	1	..	..	..	..	3	2	1	5	12	13
WEDNESBURY	925	526	161	105	13	15	123	109	..	6	2	..	..	..	..	..	..	1	59	1	46	35	83
WEDNESFIELD	143	69	21	2	4	4	21	17	..	..	..	..	..	..	..	..	..	2	..	2	6	15	4
WILLENHALL	697	358	118	57	11	15	100	57	..	3	2	..	..	..	..	..	..	2	3	9	5	30	67
Totals	23765	13574	4200	2269	558	508	3750	2289	..	130	371	..	121	1	..	43	..	38	668	208	631	688	2398 819

RURAL.

* Not including Burntwood Asylum.

RURAL—continued.

DISTRICT.	Deaths from subjoined causes.									
	Deaths from all causes at subjoined ages.		Deaths from all causes.		Deaths from all causes.		Deaths from all causes.		Deaths from all causes.	
REGISTERED BIRTHS.	53	38	6	4	3	..	8	17	..	..
DEATHS FROM ALL CAUSES.	543	289	65	24	6	6	83	65	..	..
1 AND UNDER 5.	15	35	96	38	21	17	152	112	..	..
5 AND UNDER 15.	25	75	17	7	3	3	25	20	..	..
15 AND UNDER 25.	65	129	75	17	7	3	6	7	..	..
25 AND UNDER 35.	65	109	60	13	4	3	1	12	27	..
35 AND UNDER 45.	65	388	113	54	6	14	91	110	..	..
45 AND UNDER 55.	65	246	49	31	19	13	97	37	..	..
55 AND UNDER 65.	65	421	432	106	35	23	30	111	127	..
65 AND OVER.	65	791	432	106	35	23	30	111	127	..
BLORE HEATH	53	38	6	4	3	..	8	17	..	..
CANNOCK	543	289	65	24	6	6	83	65	..	..
CHEADLE	750	435	96	38	21	17	152	112	..	..
ECCLESFIELD	129	75	17	7	3	3	25	20	..	..
GNOSALL	109	60	13	4	3	1	12	27	..	..
KINGSWINFORD	613	388	113	54	6	14	91	110	..	..
LEEK	421	246	49	31	19	13	97	37	..	..
LICHFIELD	791	432	106	35	23	30	111	127	..	..
MAYFIELD	104	70	11	2	8	3	13	33	..	..
NEWCASTLE	186	94	15	7	9	5	28	30	..	..
SEISDON	329	215	32	15	8	14	61	85	..	..
ALL OTHER DISEASES.	25	..	..	..	..	..	..	..	..	..
HEART DISEASE.	146	11	41	19	11	41	11	47	5	246
BRONCHITIS, PNEUMONIA, & PLEURISY.	38	12	3	13	12	3	13	12	3	38
PHTHISIS.	12	6	4	2	6	4	2	6	4	12
WHEEZING.	6	..	..	..	..	..	..	..	..	6
MASTITIS.	5	..	..	..	..	..	..	..	..	5
DYSENTERY.	35	18	1	8	27	64	18	1	8	35
DIARRHOEA AND DYSENTERY.	35	18	1	8	27	64	18	1	8	35
COUGH.	35	18	1	8	27	64	18	1	8	35
BRYSIPELAS.	35	18	1	8	27	64	18	1	8	35
CHOLERA.	35	18	1	8	27	64	18	1	8	35
CONFINED.	35	18	1	8	27	64	18	1	8	35
RELAPSING.	35	18	1	8	27	64	18	1	8	35
TYPHOID.	35	18	1	8	27	64	18	1	8	35
TYPHUS.	35	18	1	8	27	64	18	1	8	35
DIPHTHERIA AND MEMBRANOUS GROUP.	35	18	1	8	27	64	18	1	8	35
SCARLETINA.	35	18	1	8	27	64	18	1	8	35
SMALLPOX.	35	18	1	8	27	64	18	1	8	35
65 AND UPWARDS.	229	11	43	24	11	43	24	11	43	229
15 AND UNDER 15.	136	11	43	24	11	43	24	11	43	136
5 AND UNDER 5.	36	1	2	1	2	1	2	1	2	36
1 AND UNDER 1 YEAR.	36	1	2	1	2	1	2	1	2	36
UNDER 1 YEAR.	36	1	2	1	2	1	2	1	2	36
15 AND UNDER 15.	209	11	43	24	11	43	24	11	43	209
5 AND UNDER 5.	17	8	9	13	19	86	33	17	8	17
1 AND UNDER 1 YEAR.	17	8	9	13	19	86	33	17	8	17

RURAL—continued.

DISTRICT.	Population at all ages.	Census, 1891.	Best estimated to 1900.	Census, 1901.	General mortality per 1000 of population.	Birth-rate per 1000 of population.	Mean area per person in acres.	Mean area per person in acres.	General mortality per 1000 of population.	Mortality in children under one year per 1000 registered births.	General mortality per 1000 of population.	Mortality in children under one year per 1000 registered deaths.	General mortality per 1000 of population.	Mortality per 1000 of population.	Scarlatina.	Smallpox.	Diphtheria and scarlatina.	Measles.	Whooping Cough.	Typhus.	Bacillary or Typhoid.	Diarrhoea and dysentery.	Phthisis.	Diseases of Respiratory Organs.	Percentage corrections on basis of 1901 Census.	Individual zymotic mortality per 1000 of population.		
SEISDON	12325	13773	12897	2·6	23·3	15·6	97	0·94	..	0·21	..	0·29	0·43	..	..	..	..	..	..	..	..	..	..	..	..	..
STAFFORD	10320	10940	10403	4·7	23·4	14·7	117	1·82	..	0·18	0·64	0·18	0·54	..	..	..	..	..	..	..	..	..	..	..	..	..
STOKE-ON-TRENT	4818	5884	4808	0·9	28·2	18·3	156	4·58	..	0·67	2·88	0·34	..	..	..	..	..	..	..	..	..	..	..	..	..	..
STONE	8174	9370	8226	3·7	24·0	14·3	80	0·42	..	..	..	0·32	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TAMWORTH Staffs. portion. }	4770	5521	5497	3·9	23·3	14·4	124	1·44	..	..	0·54	0·90	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TUTBURY	9035	9553	9137	2·6	27·6	12·9	106	0·94	..	..	0·41	0·41	..	..	..	..	..	..	..	..	..	..	..	..	..	..
UTTOXETER	8126	8050	8128	6·0	24·1	14·0	67	0·86	..	..	0·49	..	0·24	..	..	..	..	..	..	..	..	..	..	..	..	..
WALSALL	9319	10931	10280	0·9	34·1	17·6	182	1·55	..	0·18	0·74	0·18	..	..	..	..	..	..	..	..	..	..	..	..	..	..
WOLSTANTON	31953	34410	36971	0·3	39·0	20·9	162	4·27	..	..	0·66	1·16	1·04	0·17	..	..	..	..	..	..	..	..	..	..	..	..
Totals and Averages	214670	234176	231106	2·6	29·8	16·8	134	1·89	..	0·22	0·48	0·48	0·21	..	..	..	..	..	..	..	..	..	..	..	..	..
																									0·37	0·77	2·71	1·7

RURAL—continued.

Table showing Result of the Working of the Compulsory Notification of Infectious Diseases Act.

Note.—Cases of Measles and Whooping Cough are only given when these are included in the diseases compulsorily notified. Smallpox, Scarlet Fever, Diphtheria, and Fevers alone are included in the percentage calculation of hospital cases.

Hospitals exist in those districts against which an asterisk is placed.

URBAN

URBAN—continued.

District, Population Cost of Notification per 1000 of Population, Percentage of Cases treated in Hospital.		Cases ...		Under 5 ...		5 & upwards		41		5		6		18		...		1		45		Cough.		Whooping			
BILSTON.*	24,500.	Deaths ...	...	Under 5 ...	...	Under 5 ...	...	2	...	6	...	3	...	7	...	...	1	...	1	...	34	8	Measles.	Erysipelas.	Cholera.	
11/10.				5 & upwards	...	5 & upwards	...	2	...	3	...	4	...	4	...	...	1	...	1	...	1	...	Puerperal	Fever.		
42.2.		Cases treated in hospital ...	...	Under 5 ...	...	Under 5 ...	...	21	...	...	...	6	...	6	...	...	2	...	2	...	10	12	Continued	Measles.	Erysipelas.	
BRIERLEY HILL.*	12,250.	Cases ...	...	Under 5 ...	...	Under 5 ...	...	1	...	1	...	1	...	7	...	...	3	...	3	...	6	6	Typhus	Measles.	Fever.	
11/-		Deaths ...	...	5 & upwards	...	5 & upwards	...	32	...	4	...	4	...	7	...	...	3	...	3	...	10	12	Continued	Measles.	Fever.	
2.2.		Cases treated in hospital	Under 5	Under 5	1	...	2	...	2	...	1	...	1	...	2	...	2	...	1	...	Typhus	Measles.	Fever.	
BROWNHILLS.*	13,031.	Cases ...	...	Under 5 ...	...	Under 5 ...	...	61	...	2	...	5	...	17	...	...	1	...	1	...	25	25	Typhus	Measles.	Fever.	
£1 1s. 3d.		Deaths	5 & upwards	...	5 & upwards	...	5	...	5	...	5	...	1	...	1	...	1	...	1	...	16	15	Typhus	Measles.	Fever.	
Nil.		Cases treated in hospital	Under 5	Under 5	—	...	—	...	—	...	1	...	1	...	1	...	1	...	6	6	Typhus	Measles.	Fever.	
BURSLEM.*	40,868.	Cases ...	...	Under 5 ...	...	Under 5 ...	...	104	...	12	...	3	...	34	...	...	8	...	8	...	29	29	Typhus	Measles.	Fever.	
£2 0s. 8d.		Deaths	5 & upwards	...	5 & upwards	...	139	...	190	...	24	...	71	...	1	...	1	...	1	...	34	28	Typhus	Measles.	Fever.	
15.2.		Cases treated in hospital	Under 5	Under 5	7	...	6	...	49	...	25	...	6	...	6	...	6	...	6	6	Typhus	Measles.	Fever.	

URBAN—continued.

† Measles included among diseases notified.

URBAN—continued.

* English.

URBAN—continued.

URBAN—continued.

URBAN—continued.

District, Population, Cost of Notification per 1000 of Population, Percentage of Cases treated in Hospital.		Whooping Cough.									
		Measles.		Bryspelias.		Cholera.		Fever.		Puerperal Fever.	
		Smallpox.		Scarlatina.		Diphtheria.		Typhus.		Fever.	
SEDGLEY.* 15,150.	Cases	Under 5	5 & upwards	49	14	15	12	..	..	..	17
	Deaths	Under 5	5 & upwards	7	..	..	..	..	..	..	25
	Cases treated in hospital	Under 5	5 & upwards .....	..	3	..	..	..	..	..	1
	Deaths	Under 5	5 & upwards .....	..	..	..	..	..	..	..	..
SHORT HEATH. 3,703. 8/9. Nil.	Cases	Under 5	5 & upwards .....	..	3	2	..	..	..	..	2
	Deaths	Under 5	5 & upwards .....	..	1	..	..	..	..	..	..
	Cases treated in hospital	Under 5	5 & upwards .....	..	2	..	..	..	..	..	..
	Deaths	Under 5	5 & upwards .....	..	..	..	..	..	..	..	..
SMALLTHORNE. 6,275. £1 7s. 10d. Nil.	Cases	Under 5	5 & upwards	42	21	..	3	..	..	..	4
	Deaths	Under 5	5 & upwards .....	..	2	..	..	..	..	..	..
	Cases treated in hospital	Under 5	5 & upwards .....	..	2	..	..	..	..	..	..
	Deaths	Under 5	5 & upwards .....	..	1	..	..	..	..	..	..
SMITHWICK.* 55,700. 14/3. Nil.	Cases	Under 5	5 & upwards .....	..	..	..	..	..	..	..	..
	Deaths	Under 5	5 & upwards .....	..	35	21	1	..	24	..	3
	Cases treated in hospital	Under 5	5 & upwards .....	..	2	4	..	..	..	..	48
	Deaths	Under 5	5 & upwards .....	..	1	..	5	..	..	..	14

URBAN—continued.

URBAN—continued.

URBAN—Continued.

RURAL

† Tent available.

RURAL—continued.

District, Population, Cost of Notification per 1000 of Population, Percentage of Cases treated in Hospital.		Whooping Cough.			
		Cases	Under 5 5 & upwards	Under 5 5 & upwards	Under 5 5 & upwards
GНОSALL. 5,020. 5/11. Nil.	Cases	...	2	1	...
	Deaths	...	6	...	1
	Cases treated in hos- pital	...	...	...	...
KINGSWINFORD.* 19,994. 7/9. 38.3.	Cases	Under 5 5 & upwards	15 24	1 1	1 6
	Deaths	Under 5 5 & upwards	...	...	...
	Cases treated in hos- pital	Under 5 5 & upwards	...	...	...
LEEK.* 14,868. £1 5s. 8d. 34.9.	Cases	Under 5 5 & upwards	13 85	4 32	5
	Deaths	Under 5 5 & upwards	2	4	...
	Cases treated in hos- pital	Under 5 5 & upwards	50	...	...
LICHFIELD.* 24,699. 12/9. 30.6.	Cases	Under 5 5 & upwards	12 42	7 29	...
	Deaths	Under 5 5 & upwards	...	...	...
	Cases treated in hos- pital	Under 5 5 & upwards	1	5	...
			8	8	...
		...	22	8	...

RURAL—continued.

District, Population, Cost of Notification per 1000 of Population, Percentage of Cases treated in Hospital.		Smallpox.		Scarlatina.		Diphtheria.		Measles.		Whooping Cough.	
MAYFIELD.	4,160. £1 4s. 7d.	Cases	Under 5	Under 5 & upwards	26	11	..	..	..	..	4
	Nil.	Deaths	Under 5	Under 5 & upwards	1	1	..	..	..	..	..
NEWCASTLE.	7,205. £1 2s. 6d.	Cases treated in hos- pital	Under 5	Under 5 & upwards	6	2	..	..	..	..	..
	Nil.	Cases	Under 5	Under 5 & upwards	26	7	..	15	..	2	..
		Deaths	Under 5	Under 5 & upwards	1	..	..	..	..	..	7
SEISDON.*	13,773. 5/1.	Cases treated in hos- pital	Under 5	Under 5 & upwards	1	..	..	..	..	..	..
	42.1.	Cases	Under 5	Under 5 & upwards	2	..	..	..	..	..	..
STAFFORD.*	10,940. £1 1s. 8d.	Cases treated in hos- pital	Under 5	Under 5 & upwards	8	..	..	..	..	..	..
	54.5.	Cases	Under 5	Under 5 & upwards	55	30	2	..	3	..	..
		Deaths	Under 5	Under 5 & upwards	1	..	4	..	..	1	..
		Cases treated in hos- pital	Under 5	Under 5 & upwards	1	..	3	..	..	..	2

RURAL—continued.

RURAL—continued.

URBAN—continued.

District and Population	Dwelling-houses and Schools.	Precautions against infectious disease.										132														
		Food supply & water.	Food supplies of unwholesome food.	Samples of food taken for analysis.	Samples of food found adulterated.	Samples of water condemned as unfit for use.	Houses disinfected after disinfection of premises.	Properties disinfecting premises.	Properties and premises of manure.	Water-supply.	Offensive trades.	Food supply.														
Brownhills. 13,031.	Inspections & observations made by authority notice.... Nuisances abated after notice....	21	40	23	36	70	10	60	310	268	2000	37	2000/102	44	167	7	4	5	1	6	313	5631				
Burslem. 40,868.	Inspections & observations made by authority notice.... Nuisances abated after notice....	47	21	40	23	..	1	..	2	5	18	225	37	278/102	..	167	7	4	5	1	6	313	1303			
Burton-on-Trent. 53,330.	Inspections & observations made by authority notice.... Nuisances abated after notice....	9	29	8	..	11	111	67	68	48	6	21	27	4	218	12	..	12	..	..	..	95	746
Cannock. 23,000.	Inspections & observations made by authority notice.... Nuisances abated after notice....	36	..	8	..	9	8	12	93	593	26	12	246	..	12	86	..	..	..	..	..	351	1492
Coseley. 22,000.	Inspections & observations made by authority notice.... Nuisances abated after notice....	194	131	13	14	..	40	206	81	173	177	156	39	..	10	..	29	45	13	6	..	29	1356			
		156	120	13	..	..	..	32	..	3	4	78	..	..	7	..	29	..	13	6	..	29	490
		156	120	13	*14	..	..	32	..	3	4	78	..	..	7	..	29	..	13	6	..	29	504
																						3	2	..	42	1

* 2 taken down; 12 closed.

URBAN—continued.

District and Population.		Dwelling-houses and Schools.		Food supply & Water.		Precautions against infectious disease.		133	
								Number of premises	Number of cases
Darlaston.	15,629.	Inspections & observations made	3 20	2 ..	40 46	52 121	2975 12	.. 25 ..	34 ..
		Formal notices by authority	3 20	2 ..	.. ..	.. ..	.. ..	8 ..	34 ..
		Nuisances abated after notice	3 20	2 ..	.. ..	.. ..	.. ..	12 ..	..
Fenton.	23,000.	Inspections & observations made	115 167	7 ..	169 88	109 164	.. ..	1761 183	481 1009
		Formal notices by authority	36 57	15 2	.. 5	9 12	6 ..	347 51	165 66
		Nuisances abated after notice	36 57	15 2	.. 5	7 12	6 ..	337 51	161 256
Handsworth	50,000.	Inspections & observations made	104 50	10 12	.. 28	18 28	15 ..	124 16	60 345
		Formal notices by authority	48 18	2 6	.. ..	.. ..	.. ..	54 6	10 136
		Nuisances abated after notice	40 17	2 6	.. ..	.. ..	.. ..	38 6	10 120
Heath Town	8,500.	Inspections & observations made . . . . .	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
Kidsgrave.	4,410.	Formal notices by authority	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
		Nuisances abated after notice . . . . .	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..

Suggested form of Inspector's Return not adopted.

Inspector's Return not received.

URBAN—Continued.

District and Population.		Dwelling-houses and Schools.		House drainage.		Food supply & water.		Precautions against infectious disease.	
Leek. 15,386.	Lichfield. 7,864.	Inspections & observations made Formal notices by authority Nuisances abated after notice.	Inspections & observations made Formal notices by authority Nuisances abated after notice.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Defective Traps. No disseen. Defective traps. Samples of food taken for analysis. Seizures of unwholesome food. Samples of water considered adulterated. Samples of water taken for analysis. as unfit for use.	Defective traps. No disseen. Defective traps. Samples of food found adulterated. Samples of water taken for analysis. as unfit for use.	Schools distinguished after infection. Infectious diseases. Lots of infected bedding. Infectious diseases. Infectious diseases for not notifying. Convictions for not notifying disease. Excessive of infectious disease. Convictions for not notifying disease. Infectious diseases. Schools distinguished after infection.	Infected persons or things. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for not notifying disease. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Infected persons or things.
Longton. 37,210.	Newcastle. 20,200.	Inspections & observations made Formal notices by authority Nuisances abated after notice.	Inspections & observations made Formal notices by authority Nuisances abated after notice.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Defective traps. No disseen. Defective traps. Samples of food taken for analysis. Seizures of unwholesome food. Samples of water taken for analysis. as unfit for use.	Defective traps. No disseen. Defective traps. Samples of food taken for analysis. Seizures of unwholesome food. Samples of water taken for analysis. as unfit for use.	Infected persons or things. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Infected persons or things.	Infected persons or things. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Infected persons or things.
Perry Barr. 2,176.		Inspections & observations made Formal notices by authority Nuisances abated after notice.	Inspections & observations made Formal notices by authority Nuisances abated after notice.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Unit for habitation. Dairies and Milkshops. Lodging-houses. Bakeries. Slaughtercr. houses. Central Boats. Ashpits and Praries. Deposits of refuse & manure.	Defective traps. No disseen. Defective traps. Samples of food taken for analysis. Seizures of unwholesome food. Samples of water taken for analysis. as unfit for use.	Defective traps. No disseen. Defective traps. Samples of food taken for analysis. Seizures of unwholesome food. Samples of water taken for analysis. as unfit for use.	Infected persons or things. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Infected persons or things.	Infected persons or things. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Convictions for not notifying disease. Infectious diseases for exposing. Infected persons or things.

URBAN—continued.

District and Population.	Precautions against infectious disease.									
	Food supply & water.		House drainage.		Dwelling-houses and Schools.		Food and drink.		General.	
Smallthorne 6,275.	Inspections & observations made by authority notice.....	6 30	14 7	1450 2	30 6	30 6	40 5	5 ..	1639 ..	19 ..
	Formal notices by authority notice.....	7 ..	.. ..	.. ..	6 6	6 6	.. ..	.. ..	.. ..	.. ..
	Nuisances abated after notice.....	6 30	.. ..	.. ..	.. ..	30 6	.. ..	.. ..	.. ..	72 ..
	Inspections & observations made by authority notice.....	12 ..	20 ..	246 50	90 72	141 33	63 620	12 48	3768 ..	967 ..
	Formal notices by authority notice.....	3 ..	5 ..	.. ..	.. ..	8 722	11 28	158 5	.. ..	872 ..
	Nuisances abated after notice.....	3 ..	5 ..	.. ..	.. ..	8 642	11 43	130 5	21 1 ..	4 1 ..
	Inspections & observations made by authority notice.....	2 ..	.. ..	60 56	70 56	325 ..	4 ..	61 67	.. ..	348 88
	Formal notices by authority notice.....	2 ..	9 ..	.. ..	.. ..	.. ..	4 ..	61 67	.. ..	1 ..
	Nuisances abated after notice.....	2 ..	8 ..	.. ..	.. ..	.. ..	4 ..	61 66	.. ..	.. ..
Stafford. 20,873.	Inspections & observations made by authority notice.....	52 6	84 39	138 ..	12 29	150 559	14 15	294 ..	36 ..	19 6 7 7 1510
	Formal notices by authority notice.....	44 6	84 2	93 ..	2 29	34 521	13 14	287 ..	36 ..	19 2 2 1 1230
	Nuisances abated after notice.....	43 6	20 2	26 ..	2 10	27 502	13 13	243 ..	35 ..	18 2 1 1004 4 ..
Stoke-on-Trent. 29,439.	Inspections & observations made by authority notice.....	46 3	3 12	9 ..	27 28	63 18	8 ..	2 18	36 6	10 10 4 ..
	Formal notices by authority notice.....	23 1	1 1	.. ..	3 2	9 9	4 ..	1 9	18 3	5 5 2 ..
	Nuisances abated after notice.....	17 4	1 1	.. ..	3 2	9 4	4 ..	1 9	14 3	5 5 2 ..
Stone. 6,230.	Inspections & observations made by authority notice.....	46 3	3 12	9 ..	27 28	63 18	8 ..	2 18	36 6	10 10 4 ..
	Formal notices by authority notice.....	23 1	1 1	.. ..	3 2	9 9	4 ..	1 9	18 3	5 5 2 ..
	Nuisances abated after notice.....	17 4	1 1	.. ..	3 2	9 4	4 ..	1 9	14 3	5 5 2 ..
Several.	Defective premises.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Water supply.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Animals in improper keeping.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Offensive trades.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Smoke nuisances.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Defective trades.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Refuse & manure.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Water closets.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Defective premises.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	No disease.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Defective premises.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	House drainage.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	Food and drink.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..
	General.	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..

URBAN—continued.

URBAN—continued.

District and population.		Dwelling-houses and Schools.		House drainage.		Food supply & water.		Precautions against infectious disease.	
Cannock. 16,415.	2,127.	Inspections & observations made	5	Structural deficiencies.	24	Food conditions.	8	Counted persons for expenses of	139
		Formal notices by authority	4	Overcrowding.		Inspections & observations made		infected persons or others.	
		Nuisances abated after notice	5	Unfit for habitation.		Formal notices by authority		Presentations for expenses of	
			20	Structural deficiencies.		Nuisances abated after notice		existing persons or others.	
Cheadle. 25,000.		Inspections & observations made	309	Structural deficiencies.	4	Inspections & observations made	4	Counted persons for expenses of	
		Formal notices by authority	2	Overcrowding.	2	Formal notices by authority	2	existing persons for others.	
		Nuisances abated after notice	3	Unfit for habitation.	3	Nuisances abated after notice	1	infected persons or others.	
 Eccleshall. 6,256.		Inspections & observations made	2	Structural deficiencies.	2	Inspections & observations made	2	Presentations for expenses of	
		Formal notices by authority	2	Overcrowding.	1	Formal notices by authority	1	existing persons for others.	
		Nuisances abated after notice	1	Unfit for habitation.	1	Nuisances abated after notice	1	infected persons or others.	
Gnosall. 5,020.		Inspections & observations made	4	Structural deficiencies.	2	Inspections & observations made	2	Counted persons for expenses of	
		Formal notices by authority	2	Overcrowding.	1	Formal notices by authority	1	existing persons for others.	
		Nuisances abated after notice	1	Unfit for habitation.	1	Nuisances abated after notice	1	infected persons or others.	

RURAL—continued.

District and Population.		Precautions against infectious disease.									
		Food taken for human consumption.					Food taken for animal feeding.				
Dwelling-houses and Schools.	House drainage.	Food taken for human consumption.					Food taken for animal feeding.				
		Seeds.	Manures.	Manures.	Manures.	Manures.	Seeds.	Manures.	Manures.	Manures.	Manures.
Seisdon. 13,773.	Inspections & observations made by authority.	24	1	...	...	...	106	9	7	95	31
Seisdon. 13,773.	Formal notices made by authority.	24	1	...	...	...	106	1	1	8	11
Seisdon. 13,773.	Nuisances abated after notice.	24	1	...	...	...	106	1	1	6	9
Stafford. 10,940.	Inspections & observations made by authority.	24	1	...	...	...	264	12	28	146	1
Stafford. 10,940.	Formal notices made by authority.	24	1	...	...	...	264	1	1	5	3
Stafford. 10,940.	Nuisances abated after notice.	24	1	...	...	...	264	1	1	5	3
Stoke-on-Trent. 5,884.	Inspections & observations made by authority.	2	1	1	...	...	106	9	7	95	31
Stoke-on-Trent. 5,884.	Formal notices made by authority.	1	1	1	...	...	106	1	1	1	6
Stoke-on-Trent. 5,884.	Nuisances abated after notice.	1	1	1	...	...	106	1	1	1	6
Stone. 9,370.	Inspections & observations made by authority.	47	44	2	2	...	40	80	14	12	7
Stone. 9,370.	Formal notices made by authority.	5	4	2	2	...	3	...	3	...	3
Stone. 9,370.	Nuisances abated after notice.	5	3	2	2	...	10	4	12	3	2
Tamworth. 5,521.	Inspections & observations made by authority.	47	44	2	2	...	10	4	12	3	2
Tamworth. 5,521.	Formal notices made by authority.	5	4	2	2	...	4	4	13	12	23
Tamworth. 5,521.	Nuisances abated after notice.	5	3	2	2	...	4	4	13	12	23

RURAL—continued.

District and Population	Precautions against infectious disease.									
	Dwelling-houses and Schools.	House drainage.	Food supply & water.	Precautions against infectious disease.						
Tutbury. 9,553.	Inspections & observations made by authority	2	2	2	2	2	2	2	2	2
	Formal notices by authority	57	57	2	2	2	2	2	2	2
	Nuisances abated after notice.....	12	11	2	2	2	2	2	2	2
	Inspections & observations made by authority	42	42	1	1	1	1	1	1	1
Uttoroxeter.* 8,050.	Inspections & observations made by authority	4	4	1	2	2	2	2	2	2
	Formal notices by authority	5	5	4	1	2	2	2	2	2
	Nuisances abated after notice.....	5	5	4	1	2	2	2	2	2
Walsall. 10,931.	Inspections & observations made by authority	43	43	21	9	..	45	64	5	12
	Formal notices by authority	17	17	21	7	..	4	4	3	3
	Nuisances abated after notice.....	26	26	32	17	7	..	4	4	3
Wolstanton. 34,410.	Inspections & observations made by authority	.....	.....	.....	.....	.....	.....	.....	.....	.....